UNIVERSITY OF MYSORE

STUDIES IN PHILOSOPHY No. 3

MAN IN THE MAKING

BY

J. B. FREEMAN

PUBLISHED BY

THE UNIVERSITY OF MYSORE

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"That they may be one"

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First Edition—1,000 Copies

PRINTED BY

H. R. ABDUL GAFFAR, B.A., PROPRIETOR
MODI POWER PRINTING WORKS,
BANGALORE CITY

1950

PREFACE

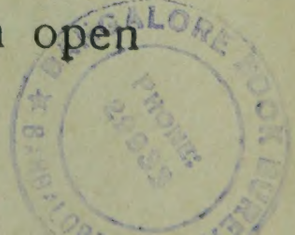
Between the completion of a book and its presentation to the public there must necessarily intervene a considerable time. This work, however, has taken an inordinately long time to appear, owing to several unfortunate circumstances. It was actually finished over five years ago. I have been assured by friends that it contains many new ideas which will be of permanent interest, and so I do not regret its appearance.

It has been my endeavour in this book, just as in my previous work *Science, Cause, and God*, to bring Scholastic Philosophy into line with modern thought, and to show that even in the realm of Psychology there remains much that is sound and sane in the labours of the ancients.

The volume covers a large field, and aims at being of use both to professors and to students. It is divided into four parts. Parts III and IV may be read without going through Parts I and II; but I believe that the constructive portions of Part III and the critical portions of Part IV can best be appreciated in the light of the earlier discussion. A comprehensive Alphabetical Index has been added.

The preparation of this work has entailed a great deal of labour on my part. I hope it will bear fruit.

I am not indebted to any one author in particular having consulted very many, and always with an open mind.



I thank the University of Mysore for having very kindly sponsored its appearance in print. I have very pleasant recollections of my connection with the University and its officials, and I hope to renew the connection some day soon. Their large-mindedness made possible the publication of this work of an author who does not belong to any of the modern schools of Psychology. He does appreciate all of them, but can in no sense be called an eclectic.

MYSORE,
March 7th, 1950.

J. B. FREEMAN.

CONTENTS

PART I

Chapter		PAGE
1	Primitive Life	1
2	Living Cells	16
3	Physiological Movements	27
4	Appetite and Movement	51
5	Sensation	59
6	Pleasure and Pain	75
7	Instinct and Learning	97
8	Some Characteristics of Man	118

PART II

9	Psychology and Philosophy	131
10	The Study of Man	142
11	Reactivity in Man—Realism	156
12	Mind. Imagination. Association. Memory	172
13	Intelligence	204
14	The Intelligibility of the World	212
15	Truth	232
16	Science	239
17	Illusions, Reverie and Dreams	247
18	Voluntary Action	252
19	Freedom	259
20	Responsibility	279
21	Indeterminacy	283

Part III

Chapter		PAGE
22	Hypnotism	302
23	Personality	326
24	Self and Non-Self. Ego and Non-Ego	332
25	Character	343

Part IV

26	Introspection	382
27	Some Modern Introspectionists	396
28	The Existentialists	405
29	Freudian Psycho-analysts	413
30	Analytical Psychology	445
31	Individual Psychology....	453
32	Gestalt Psychology	458
33	Hormic Psychology	467
34	Behaviourism	475
	Index	494

Nilil Obstat.
I. H. Lobo,
Censor Dep.
15—2—1949.

Imprimatur.
R. Feuga,
Bishop of Mysore.
16—2—1949.

PART I

CHAPTER I

PRIMITIVE LIFE

1. The smallest and simplest things accepted as living beings are *Bacteria*. Each is about a twenty-five thousandth of an inch in thickness and about six times as long. Being so small and having apparently the same internal structure, as far as can be discerned, they have to be classed only according to shape. The rod-like kinds are called *Bacilli*; the round varieties *Cocci*, and the wrigglers *Spirilli*. The spirilli have hairs on them which lash about and carry them through a liquid medium. Some have a characteristic group life, growing in long chains and even in parallel chains. The species can only be distinguished by their effects, which may be very varied even in the same circumstances. This should make us look for differences in structure, but we are at present unable to discover any.

2. They breed at a terrific rate, about once every half an hour or about fifty times a day. Their manner of breeding is very simple. It is called *Fission*. They grow to a certain size; a constriction appears which gets deeper and deeper until the organism is completely nipped in two. In the place of one living thing there are now two, each exactly like the original one. There are no sexes. This would suggest in the evolution theory that differentiation into sex for the primary purpose of reproduction has other subsidiary purposes as well, *e.g.*, specialization, variation, refinement.

3. Bacteria survive under the most difficult conditions. When conditions are unfavourable they become *spores*, tough and quiescent objects. In this state they are capable of withstanding for fifteen minutes a pressure of two atmospheres and a temperature of 120°C, and can bear extreme cold even better, being known to retain their vitality for six months at a temperature of—190°C. In their active state they can be killed easily by swift boiling. Spores can remain dormant for years and even centuries, waiting only for favourable conditions to awaken into activity. As soon as they drop into a suitable environment the dormancy ends and they reproduce vigorously. We have here an illustration of adaptation of the self to the environment.

4. Some bacteria are extremely harmful to man. They exude a substance, called a *toxin*, that permeates into the blood-stream. The effects on man are various and the bacteria are classified into species accordingly. Fortunately we have the power of producing *antitoxins* in our blood under the action of the germs. In fact in some cases the blood of a person who has become immune to a disease may be used to destroy the germs in another or help to render him immune also.

5. Since they breed so rapidly, at the rate of say 100,000 generations per annum, we should expect in a few years to witness some evolution in species if such were possible. The discovery of new diseases attributed to bacteria, or the sudden emergence of an old one in a specially virulent form, is not to us sufficient evidence of evolution or of "mutation" of species. It is certainly not direct evidence and, moreover, the argument is from difference of "effect" to difference of "cause", or variation of "effect" to variation of "cause" in a case where the "effect" is conditioned by so many other factors besides mere man and mere bacteria, *i.e.*, where the factors do not form an isolated system.

6. Bacteria eat all sorts of things, carbon dioxide, stones, bricks, dead vegetation, etc. Some live only on "inorganic" matter, consuming it and turning it into their living substance: water and mineral salts from the soil, carbon dioxide and nitrogen from the air. Even supposing such bacteria to have been the original living things, it will only be presumption to adduce this fact as a scientific "proof" that life originated from dead matter. Even if, as some scientists do, we assume that a living thing was produced by a chance arrangement of atoms, how can one attribute a property to it not found in other things? We have produced very complex organic compounds, *colloids* and *gels* which come as near in constitution to Protoplasm, the vital substance of which all living things are composed, as we can get to, and even exhibit many of the properties of the living cell; but they are acknowledged to be mere inanimate chemicals. Experiments are being conducted to see whether cosmic rays will endow them with life. Until some such experiment meets with success our attitude may be one of expectation, but also of abeyance of judgment. It is unscientific to accept the conclusion as established and argue therefrom. We may justifiably consider a living thing as representing an energy of a higher type superimposed on and organising the energies represented by its "matter".

7. Bacteria require the simplest food. Out of comparatively simple chemicals they build up their living tissues, sometimes even without the aid of sunlight. However, there are some that require more complicated food, substances already built up by the activity of living things. They are classified by this consideration alone. Those that contain chlorophyll and use sunlight are called Plants, while those that do not are called Animals. This distinction is not in general accepted. There are other activities besides choice of food characterising animals. Animals in general are able to move about, and they are sensitive.

All bacteria, however, exhibit certain common features. They are simple structures, with boundaries in space and a narrow range of volume. In structure there are not only many-celled but also one-celled plants as well as animals, and the structures of the single cells are similar in appearance. Again, each is capable of intrinsic movement, ***motus ab intrinseco,*** a sort of government of its movements on its own behalf, the ability to take in external objects and use them to build itself and to reproduce cells of its own kind.

8. The "fixation" of nitrogen, *i.e.*, obtaining it from the air and storing it in the nodules on the roots of certain plants, *e.g.*, beans, peas, lupins, has been traced to the action of bacteria. Others use mineral substances in the construction of their cell-walls. To these is attributed the accumulation of ores.

9. Life does not penetrate more than eight feet below the surface of the earth. The accumulation of plant-debris is prevented by the action of bacteria which consume the vegetable matter. In the process of nutrition on vegetable products several substances are released, *e.g.*, methane and hydrogen sulphide. There is also an evolution of heat. It is this that helps to bring about the so-called "spontaneous combustion" of haystacks, for the very fine powder into which some of the hay is reduced needs only a little heat to make it flare up in combining with atmospheric oxygen.

10. The phosphorescence of fish and of objects floating in the sea and of decayed wood is also due to the action of bacteria, but the process is not yet clear.

11. Most bacteria and their spores are killed by sunlight. It is found that the invisible ultra-violet rays (these can be produced artificially), are especially suitable for this purpose.

12. It is by bacterial action that many changes are effected, *e.g.*, sugar into alcohol, wine into vinegar, milk into butter and cheese. The fine flavours of alcoholic drinks and beverages of milk products and other foods and even of cured tobacco are due to various bacteria; and so also many odours and perfumes. We have not yet succeeded in producing the substances that bacteria exude in bringing about fermentation. We have not even isolated them.

13. That a single-celled creature may be either a "plant" or an "animal" would point to a difference of structure which is not evident to us. It would also indicate something more: since the single-celled animal manifests activity similar to the single-celled plant, and also of a higher type, it represents an energy of a higher type superimposed on vegetative energy and organising it.

14. Single-celled bodies do not exceed a certain size, say about a quarter of an inch. Their size has something to do with the ratio of surface area to the volume. When a linear dimension is increased the surface increases according to its square, but the volume according to its cube. The actual size is such as is suitable to the structure and function of the cell; a larger organism could not work on the same lines.

15. The *Amoeba* is the tiniest of living things that is decidedly an animal. It is a tiny one-celled blob of living jelly, found abundantly in ponds. It has a definite boundary, *i.e.*, it keeps itself together in a mass, but it has no definite shape. It exhibits the activities of *movement*, *feeding*, *excretion* and *propagation*, and it is *sensitive*, living on minute plant and animal matter and needing air and water; showing likes and dislikes in the matter of heat, light and other conditions, and of food.

16. It is almost transparent and has two spots in it, one dark,—the *nucleus* and the other clear,—the *contractile vacuole*. Its Protoplasm is roughly distinguished into three kinds; the *Ectoplasm* or the clear gelatinous soft envelope of the cell; the *Endoplasm* or a granular coarser substance; and the *Cromatin* or the contents of the nucleus which controls the working of the living cell and the transmission of hereditary qualities in generation. Chromatin gets its name from the fact that it takes up certain dyes and shows up clearly against the rest. When feeding, other spots may be seen, the *food-vacuoles* in the endoplasm. The nucleus is the essential part; damage to it results in death. The Ectoplasm and the Endoplasm are equally important, but damage can be repaired.

17. How the amoeba moves by flowing, as it were, in one direction, exuding pseudopodia, how it gets hold of its food and excretes the waste liquid, and reproduces, are most interesting to watch. *Respiration* is carried on all over the surface of the body; oxygen is absorbed from the water in which it is dissolved and carbon-dioxide is given off.

18. When any of the necessities of life have become exhausted or conditions turned unfavourable, the amoeba contracts into a ball with a resistant cover, called a *cyst*. This lies dormant until conditions improve or until it is transferred somehow to another pond where conditions are favourable.

19. The amoeba reproduces by *fission*. The chromatin in the nucleus condenses into the form of a tangled skein, which resolves into a number of little rods and specks of various shapes and sizes. These are known as *chromosomes*. Their number varies with different species of animals, but is constant within each species. When the cell is about to divide the chromosomes set themselves round in a circle in

the plane of the constriction ; each splits up longitudinally and each half goes into the nearer half of the cell. Then division takes place, and the chromosomes in each new cell again fuse up into a mass of chromatin within a nucleus. Thus each nucleus has the same number and types of chromosomes as the original one from which it came.

20. Reproduction is adjusted to the food supply. If this is plentiful, it is rapid ; if not, it is slow. Forming a cyst and regulating reproduction are illustrations of adaptation of the self to the environment. The amoeba's activities show themselves as unconsciously purposive, reasonable without reasoning. It can protect itself against danger and comes to death only by violence.

21. *Protozoa* is the name of a sub-kingdom of the animal world. It includes all animals, *e.g.*, the amoeba, whose bodies consist of a single *cell*, the simplest unit of living matter. *Metazoa* is the name of the other sub-kingdom of animals with bodies built up of many cells.

22. The sub-kingdom Protozoa has only one phylum, also called *Protozoa*. In this phylum there is a class called *Infusoria*, related to the amoeba. They are miscellaneous creatures also commonly found in ponds and pools and streams.

23. The *Paramecium* called "Slipper Animalcule" from its shape, belongs to the class of *Infusoria*, so called because they abound in infusions of decayed vegetable matter, or *Ciliata*, because they are covered with tiny hairs called "cilia."

24. It has a fairly rigid skin called a *Pellicle*, and a definite shape. Nevertheless, it can contort itself and squeeze in through a narrow opening or round a sharp corner.

25. It would take us too much out of our way to describe its method of propulsion, of feeding and excretion and of avoiding obstacles, very different from that of the Amoeba. In the matter of reproduction also there is a difference. The paramecium normally reproduces by fission, like the Amoeba. But apparently this cannot go on indefinitely. Soon the reproductive process comes to a halt, and a period of "depression", or lethargy sets in. Its surface becomes adhesive, and when two of them touch they stick together, both facing the same direction. Some mutual exchange of chromatin probably takes place during this *Conjugation*. Then they separate, apparently unchanged, but rejuvenated and ready to procreate again in the normal way. The nucleus of the Paramecium is double; one part, the ***Meganucleus***, is large; the other, the ***Micronucleus***, is small and is attached to the surface of the larger part.

26. It will not be necessary to consider other single-celled animals and their improvements over the Amoeba's structure and methods of movement, feeding, protection and reproduction, or the taking up of stationery positions or the formation of "colonies". A ***colony*** is a compound organism made up of a number of separate and identical individuals, each capable of feeding, reproducing and carrying on its individual functions, but permanently joined to the others by some sort of connection. It is generally formed by reproduction without complete separation. It has great advantages in the matter of feeding and protection.

27. Life is invariably associated with the ability of adaptation to change in the environment. Amoebae can be inured in the laboratory to conditions of heat, cold, acidity, alkalinity, or salinity such as would promptly destroy the untrained individual; the rate of reproduction can be altered.

28. According to the Evolution Theory, the

one-celled organism first developed in size, but there were natural limits to this development; so there came about *co-operative development* in colonies, then *specialisation of functions* and *division of labour*; by which a colony became a complex organism with separate parts for protection, locomotion, seizing food and digestion. No one, however, can say why the Protozoa branched out into many-celled forms. This is a great gap in the evolutionary chain. Between the single-cell and the complex unit of innumerable cells working in harmony the difference is vast. Can it be said that the Protozoa were "convinced" of the accruing advantages and so took the line of evolving into Metazoa? Or is it right to say that a property acquired by *Chance* and continued by *Selection* became hereditary? Even the *sponges* do not fill in the gap; for scientists are not agreed whether they represent a primitive or a degenerate form of life.

29. The most simple form of the *Metazoa*, apart from the sponges, is the *Hydra* of the phylum *Polyp Coelenterata*, *i.e.*, tentacled animal. It is made up of innumerable cells, each containing what looks, under the miscroscope, like the nucleus of an Amoeba. It is a long slender creature, with a "foot" for anchoring itself by, and a ring of six or eight tentacles in the middle of which is the "mouth" which also serves as the vent. Its body is made up of two layers of cells, the *Ectoderm* or outer layer, and the *Endoderm* or inner layer, within which is the gut cavity in which digestion takes place.

30. It feeds on minute living things, stinging them with tiny protuberances from its tentacles into inaction.

31. It has two methods of reproduction. One is called *budding*. An outer growth develops and finally breaks off into an independent hydra. The second method is sexual. A female hydra develops a swelling

which is an *ovary*, containing an "egg". When ripe this is exuded into the pond. A male hydra also develops a swelling, called a *testes*, from which at length innumerable male-cells or sperms are ejected into the pond. These are *spermatozoa*, microscopic living things, made up of a head and tail. The head is little more than a nucleus. These swim towards the egg. A single spermatazoon penetrates the egg, discarding its tail, and unites with the nucleus of the egg. This fusion is called *fertilisation*. The fertilised egg contains elements contributed by two different parents, the male and the female. A hydra changes its sex, but it is never male and female at the same time.

32. Examples of colonial growth are to be had in abundance. The *Carchesium* of the class *Infusoria* is a beautiful instance. Each individual, however, functions independently. A large number of animals of the phylum Coelentarata live in colonies. In *Obelia*, found on rocky seashores, the gut cavity of each individual is continuous with that of all the others, so that food captured by one goes to the nourishment of the whole group. They reproduce by budding; but the young never separate from the parent, as in Hydra. Obelia take a permanent hold of a species of seaweed, which in turn is firmly fixed to a rock. The Obelia has another method of reproduction, by which it is able to spread the species over a large area, overcoming the disadvantage of immobility. Sausage-shaped bulges, like buds, arise in the angles between the ordinary polyps and the lower branches of the colony, each protected by a flask-shaped extension surrounding it of the common horny covering. They are called *Blastostyles*. From these, disc-shaped bodies are budded off, which, after development, break away from the blastostyle and work their way out of the mouths of the protecting flasks into the open sea. Each is now a *Medusa*, a very small jelly-fish looking like the head of a daisy, which propels itself to another neighbourhood.

Each medusa is permanently either a male or a female, and sheds spermatozoa or eggs respectively into the water. From a fertilised egg a larva develops which takes up its abode on the frond of the laminaria seaweed. Here it grow up into an Obelia colony.

33. This *Alternation of Generations*, by which one generation is produced asexually by budding and the next sexually by means of eggs and sperm, is common to many of the lowest animals. The two generations are very different in appearance and habits.

34. Let us conclude this note on primitive living things by saying that the process of fertilisation has been observed and the development of a fertilised egg through many stages has actually been observed and filmed in the case of a higher animal than those mentioned above. Thus we know something of the processes of *development*, of *segmentation* and *specialisation*; of the formation of the *Mesoderm* a layer of cells from which most of the internal organs are built up, other than the ectoderm or skin-layer and the endoderm or gut-lining; also of the formation of the *enteron* or gut and the *coelom* or body cavity, the *mouth* and *anus*, the *stomach*, of outgrowths like legs and spines, and of bones. We are acquainted also with the process of *metamorphosis*, or rapid change and reorganisation of the body tissues and mode of life of certain animals, and with some astounding *life-cycles* involving several metamorphoses and different larval stages. Powerful microscopes have provided us with all this knowledge and made the processes visible.

35. Insects are a class of *Arthropods*, a phylum of animals that have hard outer skeletons and jointed limbs. Insects are distinguished by the fact that their bodies have three distinct parts: the *head* carrying the eyes, a pair of antennae, feeding limbs, mouth, etc.; the *thorax*, or central portion,

with three pairs, of legs and with or without one or two pairs of membranous wings, and the *abdomen*, which holds the main digestive apparatus and reproductive organs. The life-history of insects is most interesting. They afford examples of *parthenogenesis*, the production of fertile eggs without the intervention of male sperm, and of *viviparity*, the production of fully developed young. They are important also for the insight into *Instinct* that they give us.

36. We may now well ask: If living things can be definitely graded one above another, in what does the positive difference consist? Is it a "higher" quality to be more complex? Does the lowly Amoeba really display "higher" qualities in its capacity for adaptation, its asexual reproduction, its life of peace with its fellows, its immortality? Or on the other hand are these "inferior" to the qualities displayed by so-called "higher" beings? We generally agree on one point, *viz.*, we accept greater activity and greater variety of action as superior, and more particularly by projecting our own feelings into animals we should suppose the greater complexity, invloving a greater range of functioning and of functioning in harmony, to be associated with greater degrees and varieties of desires and pleasures. The urge to function is experienced subjectively as *desire* and the harmony of functioning as *pleasure.*

37. It has not been established that acquired traits, *e.g.*, gradual acclimatization to severe conditions of heat, cold and light, in the Amoeba are carried over in fission. This would represent a psychological "memory" of the most astounding significance. Evidently its "immortality" is not connected with immortal *personality*, for this would require at least perpetual continuity of memory through all its fissions; the immortality of the Amoeba carries with it very short remembrances and does not give it the "personal" pleasure of pleasant memories. On the other hand, the Amoeba is saved the burden of memories of

countless generations and of very many painful experiences in each.

38. The *joie de vivre* may be expected to be greater the more full the life; this in itself is a higher form of functioning. Complexity of structure, specialization of parts, differentiation of functions, and even sex, would therefore correspond to higher activity and mode of life. Man, living the life of the Amoeba would die at least of monotony, or he would curse his immortality. If a higher animal is made up ultimately of cells which differ in functions on account of specialisation, the unity and harmony of the whole must not be lost sight of, nor the fact that their activities are directed to the well-being of the whole. Each cell represents a *plan*, and the whole a *greater plan* of which the materials are the cells. From this point of view also greater complexity implies superiority, the part being *for* the whole. In man, the whole physiological structure, not very much more complex than that of the ape, is to be reckoned as a plan very much more complex than his mere physiological plan, since his manifestations bear traits over and above those that his mere physiological structure would warrant.

39. In ancient times, the Egyptians and Babylonians pollinated their date palms by hand. Probably they knew that plants also had sex. It was not until 1717 that the first hybrid plant was artificially produced, when Thomas Fairchild in England impregnated the female flower of a Sweet William with the pollen of a Carnation. Since then we have got thousands of asters, tulips, etc., and of the rose there are over 15,000 hybrids. Regular scientific pollination began only about fifty years ago after the full significance of Mendel's work was understood.

40. In 1793 the German Pastor Christian Konrad Sprengel discovered that pollination was effected by

insects as they moved from flower to flower. Darwin unearthed his work sixty years later. He discovered the two main natural modes of pollination, insect-borne and wind-borne; and he showed how inbreeding by self-pollination was naturally avoided by many flowers. In some the stamens ripen before the pistil, in some the reverse is the case; and some pistils are infertile to pollen from the stamens of the same flower.

41. The best insect pollinator is the honey-bee which for a time frequents flowers of only one kind. Butterflies, beetles, and other insects also help in the work of carrying pollen from one flower to another.

42. In 1866 Abbe Gregor Mendel, an Austrian Monk, formulated his laws of heredity. He had spent his life pollinating peas in the monastery garden. He showed that strains repeat themselves in a regular mathematical pattern and that any one particular strain can by breeding be perpetuated, increased, eliminated or blended. Even Mendel's work was forgotten, and it was only at the end of the nineteenth century that its value was recognised. The discovory of chromosomes belongs to the present century with the consequent theory of genes.

43. Pollination is also very largely effected by winds. Pollen with large air-sacs and sufficiently light is borne by the winds and scattered sometimes hundreds of miles away. Flowers with conspicuous petals and fragrance and honey are exclusively inset-pollinated. Their pollen is quite unadapted for wind transport. They have, however, innumerable devices for dousing pollen on bees and attaching it to their bodies. In the flower pollen is held in little tubes called *anthers* at the ends of stamens. The anthers are vessels which open by pores when ripe, letting free the pollen to be carried by the wind or by some insect. The bee may have to scramble over the pollen to get to the nectar, or enter so that it may be struck very

gently by the anther acting on a lever system. There are other ways also of burdening the insect with pollen.

44. Pollen is a roundish grain-like organism, invisible to the naked eye, varying from a hundredth to a ten-thousandth of an inch thick. It bears the spark of fecundating male life. The basic shapes are spheres or ellipsoids; but pollen may take also the geometrical forms of cubes, tetrahedrons and pentagon dodecahedrons, with fanciful ornamental designs. Pollen experts can identify almost any pollen.

45. Without pollen no seed would ripen. Yet it is very short-lived and frail. Its life-span may cover at the most thirty-six hours. A little drought or moisture or rapid change of temperature may kill it. Ultraviolet rays are deadly to the male germ once it is exposed through it coat. Out of a million pollen grains only one may reach its destination.* When a pollen grain lands on the stigma, or receiving surface of the ovary at the end of the pistil, of the appropriate flower, it at once begins to sprout, being drawn out into a very fine tube that travels downwards through the tissues of the stigma and pistil of the ovary until it reaches the egg-cells at the bottom. The distance traversed may be as much as a thousand times the diameter of the pollen grain. Such is the reaction of the living pollen grain to the chemical stimulator called a *hormone* exuded by the ovary. When the male sperm reaches the female cell, they fuse together and the seed is fecundated.

46. We find a marvellous *order* even in the realm of life!

---

* This would indicate that pollen has other purposes also besides rendering the ovules fertile. It goes, for example, into the making of bees-wax.

CHAPTER II

LIVING CELLS

1. A word gets its special meaning from the context in which it occurs, its position in relation to the other words and the way in which its sense integrates into that of the whole. No word, however, can take on an altogether new meaning by its mere position in a sentence, when the general sense accepted by society does not fit in with the whole; in short, the whole structure of the sentence with its significance depends on social acceptance. Again, a statement itself acquires some of its meaning from the circumstances in which it is uttered.

2. So it is with living cells. It is just about a century now that scientists began to recognise that living bodies are made up of cells, each cell representing a living unit of protoplasm with a single necleus. Vast differences of shape and size are to be found in cells from different organs of any of the higher animals. This is due to extreme specialisation. Thus nerve-fibrillae are thread-like outgrowths of neurones or cells in the spinal cord. They may be yards long. Their functions are also very different. Some cells exude calcium carbonate which make bone, others a gelatinous matter to form gristle. The cells living in the intestines absorb nutriment, those in the kindeys remove impurities from the blood; those in the liver manufacture complex substances out of the substances absorbed by the stomach and intestine cells from food.

3. *Tissue-culture* has strikingly supported the assumption. A small piece of tissue taken from any part of the body is kept in bacteria-free serum at the temperature normal to the living tissue. It lives. It

absorbs nutriment from the serum and excretes waste-products so that the serum would be poisoned. If the culture is removed, washed and placed regularly in fresh serum, the growth goes on indefinitely in a healthy state. In fact there is reproduction of cells also. The cells divide and the new cells drift off.

4. Cells of different shapes taken from different organs of a living body and cultured in serum do not reproduce copies of themselves. They rather resemble amoebae. Thus shape is a reaction to the environment, a mode of adaptation as in non-living things. Some brain tissue of an embryo frog not yet two days old was transplated by Mangold on to the skin of another embryo; when the latter matured it was found that the brain-tissue was incorporated into its skin, becoming skin tissue. When, however, the brain tissue was taken from an embryo, four days old and transplanted as before on to the skin of another embryo, the latter grew up with an extra brain situated on its chest. Moreover, the skin-cells in the neighbourhood changed into parts associated with structures connected with the transplanted tissue. Thus neighbouring cells modify each other's growth and function. Hence growth and function are also reaction to environment. A cell gets its significance or relationship to its fellows and its value or function, as a reaction of itself to its environment. It not only adapts itself to its environment but it also adapts its environment to itself. The brain tissue having got a set 'habit' or 'setting' or 'attitude' in the four-day old embryo frog displayed this capacity in a picturesque manner.

5. The Soviet biologists Balinsky and Drugomirov have specialised in methods of inducing supernumerary limbs and of transplanting cells. Drugomirov discovered that the embryonic lens of the eye can be the result of induction from the retinal part. The inducing part is very small, but it is highly differentiated. Even

the pigmentary part of the eye can be made to induce a whole eye.

6. Balinsky in 1924 repeated and confirmed the experiment made eight years previously by Filitov on newts and lizards, showing that the ear vesicle has the power of inducing the ear capsule. He also found that when grafted into the lateral region of the larva an almost normal limb was induced. He showed conclusively that the induction was not due to the development of limb material or to the splitting of limb rudiment in the side of the larva, but that it was started by the transplanted ear vesicle which activated the potentialities of the receiving material. All points along the lateral region of the embryo, at a certain stage of its development, have the power to produce limbs. When the induced limb is near the front limb, it takes the form of the front limb; when near the hind limb, it approaches in form to the hind limb, *e.g.*, in the number of digits. In 1926 Balinsky found, however, that the growth of extra limbs on the side of the newt may be stimulated by mere mechanical irritation.

7. The Russian biologist Gurvitch, working in the Rontgen Institute at Kharkov, claimed to have discovered a new phenomenon. These are '*mitogenetic*' rays. They are ultra-violet rays, of a certain band of wavelength, said to be emitted by living cells and able to stimulate growth and the sub-division of cells during growth (*mitosis*) in neighbouring cells. The intensity of the rays is measured by the increase in the number of cells that sub-divide into new cells. It is said that the greatest difficulty in the research lies not in the counting of the number of new cells formed but in the occurrence of irregularity in the mitosis. It is claimed also that differences are observable between the intensities of the mitogenetic rays emitted by the healthy cells and by cancerous cells, and that the latter can consequently be indentified, and further that if cancer be treated with

ultra-violet radiation, it loses its sensitivity to mitogenetic rays, which would otherwise affect it. Gurvitch's claims find little support outside the U.S.S.R. The acceptance of mitogenetic rays needs more objective evidence.

8. About a generation ago a new theory was evolved. It had its inspiration in the recent developments of Physics and Chemistry probing into the atom. Sex differentiation necessitating conjugation has long been considered as fundamentally connected with some sort of vital stimulation and exchange of potentialities, particularly directed to reproduction. Reproduction without sexual intercourse is found in the lowest forms of life. Even in higher forms of life, it seems to be possible. The unfertilised egg of a frog has been rendered fertile by pricking with a glass needle dipped in blood. The nature of the reproductive cells and the process of reproduction have long been studied. Even the chromosomes in different species have been noted. Biologists desired to correlate physiological characters of organisms with the chromosomes in their reproductive cells. The gene-theory of reproduction was formulated.

9. Abbe Gregor Mendel long ago (1865), discovered the laws of heredity known by its name. Many years later, they came into notice and acquired importance. The distinction between *dominant* and *recessive* characters, their manner of distribution and disjunction in hybrids was due to him. The recent gene-theory of heredity not only explains several phenomena and resolves certain anomalies, but also suggests new lines of research. Genes are invisible. Their existence has been deduced from their 'effects'. The whole theory got its inspiration from the development of sub-atomic physics.

10. Well-organised and extensive research is characteristic of the U.S.S.R. This applies particularly

to the field of genetics, on account of its vast importance in agricultural economy and expansion. The work is carried on by the Lenin Academy of Agricultural Science under the direction of Prof. N. I. Vavilov. It is part of the Academy of Sciences, which functioned at one time in Leningrad, but since 1934 works in Moscow.

11. Vavilov himself was the discoverer of 'homologous' mutations. He found that mutations arising in quite distinct species of plants proceeded often along parallel lines. A mutation of a certain sort in one species enabled him to predict a parallel mutation in another. Observing also that in some regions far more varieties of a species were to be found than in others, he suggested that the explanation was that in that region the species had a longer habitat than in the others. On this supposition the original location of a particular species is indicated by the largest number of varieties. (In our humble opinion the question whether in one particular locality mutations in a certain species may be accelerated or retarded by local factors more than in others, will also have to be investigated.) Of wheat alone there are about 31,000 varieties.

12. Russian biologists have also demonstrated that persistent inbreeding will isolate recessive characters, such as cannot be obtained by the ordinary method of selection. By inbreeding very valuable recessive characters have been isolated in herbage plants.

13. Selection and crossing are the two chief methods of improving the varieties of plants. Selection is preferable in some cases, and crossing in others. Certain undesirable characters which cannot be avoided by selection are eliminated by crossing. It has been found that there is a great difference in the hereditary constitution of cereals taken from widely diverse geographical regions; such specimens when crossed produce

remarkable characters such as are not found in the case of specimens from neighbouring regions.

14. G. D. Karpechencko succeeded in crossing entirely different species of plants in the case where their cells contained the same number of chromosomes. He thus opened out vast possibilities in the production of entirely strange plants which may be of great use and at the same time, fertile. Cabbage and mustard; cabbage, radish and mustard; cabbage, radish, rape and turnip—strange mixtures these. The cabbage-radish hybrid is sterile, but it becomes fertile when the number of chromosomes is doubled.

15. Even the sterility of hybrids has been overcome by the Soviet scientists, using a method of triple crossing between plants with different chromosome numbers. A wheat with seven chromosomes crossed with one of fourteen gave a sterile hybrid; but when the latter was crossed with a wheat of twenty-one chromosomes, a fertile product was obtained.

16. Cytological exmination discloses the number of chromosomes in the cells of plants, and indicates their general behaviour in mating.

17. Soviet scientists have also studied the period of rest and the vegetative period, and investigated effects of light and other influences. It was found that tissue growth or vegetative development is often increased by a reduction in the length of the day; *e.g.*, some species of potato develop tubers only when growing in days with short periods of light; also that treatment with ethylene chlorhydrin accelerates the development; moreover, that by an adjustment of the length of the day the rate of reproduction in plants may be accelerated. The work of H. J. Muller and the Soviet scientists has upset the definitions of classical biology.

18. t has been found possible to keep wheat specimens dormant but alive for two years, and even up to six years, in specially designed boxes.

19. Vernalisation, or *Yarovizatia* in Russian, is the process of stimulating the initial development or sprouting of the seed by various sorts of treatment, before it is planted. It has been applied on a large scale to wheat in Russia. The problem that was solved by Lysenko over twenty years ago, was to get the sowing done in spring instead of autumn, and yet have a quick crop in June, thus not only saving the seed from the rigours of the winter, but also keeping the mature plant from the heat and drought of the summer. The method varies for different sorts of wheat. Other grains and even potatoes have been vernalised; but, whereas grain has to be kept in the dark during the process, potatoes have to be kept continuously exposed to sunlight and electric light. The length of the process, the temperature, and the moisture, are properly regulated according to the nature of the thing vernalised. The changes that occur in the seed or tuber during vernalisation are not yet well understood. Lysenko distinguished between 'development' and 'growth'. A wheat seedling sown in October does not seem different in March; but it has undergone development which enables it to sprout, grow and ripen at the proper time. Whereas a seed planted in March is not able to do so.

20. I. Schmalhausen, Director of the Institute of Experimental Biology at Kiev, has made some remarkable studies on the laws of the growth of embryos and of mature organisms. He considers certain abnormal hereditary characters in poultry, such as, leg-feathering and extra claws, to be due to gene-mutation. Leg-feathering is a primary effect that appears early together with the wing-feathering; while the abnormal feet formation that accompanies it seems to be a secondary effect of the disordered

process of development of the mutated gene. The determining factors of the resulting interaction are the relative activity of the growth of the rudiments, their distance apart, and the time when the interaction begins, the latter in turn, depending on the time when the rudiments are formed. Schmalhausen formulated a law connecting the form of the growth of an organism and the course of its differentiation.

21. Chromosomes are themselves very microscopic bodies ; whose structure cannot be seen. Each is supposed to be a set of *genes*, self-reproducing substances of constant composition which determine the characters transmitted by generation. Even a tiny fruit-fly has thousands of genes.

22. Several genes are associated together in the same chromosome. A gene is sometimes active or dominant, *i.e.*, able to exert its influence always; sometimes passive or recessive, *i.e.*, able to exert its influence only in the absence of some other gene. There may be a '*crossing-over*' or transference of genes from one chromosome or gene-group to another. The crossing-over occurs in nature and may even be artificially brought about, *e.g.*, by special feeding or by modifying the environment. A method has been devised for locating the position of a gene in a chromosome and finding its distance from another gene in the group by the rate at which interchanges occur. The structure of a gene itself may be altered in ways not yet clearly understood. Some re-arrangement of atoms in the gene takes place suddenly under external unknown influences. The organism shows an altogether new character. Further, the new character is hereditary. Small variations in a race arising in the lifetime of an individual are not transmitted in generation. The gene is in general permanent and unaffected by *acquired* characters. Nevertheless, it is not absolutely immutable. Even in natural conditions characters that are hereditary suddenly appear after

several generations. A sudden variation is called a *mutation.*

23. Not long ago such changes were artificially induced, *e.g.*, in moths by dieting, and in fruit-flies by a mild dose of X-rays. Thus man is able to induce physiological character changes; he does not yet know, however, how to direct the changes or produce the characters he wants. It has been suggested that such sudden changes occurring in nature may be due to the X-rays emanating from radio-active substances in the earth or even to Cosmic rays; and there may be other causes also. The rate of mutation can be speeded up by X-rays. Dr. H. J. Muller of the University of Indiana, believes that Atom Bomb rays, such as were experienced at Hiroshima and Nagasaki, would have produced genetic changes that are likely to last for many centuries. His latest researches seem to show that mutations arise from the splitting and transposition of parts of genes and not to the conversion of genes from one sort to another.

24. The celebrated Danish scientist Herman Kalckar has made some remarkable researches on *nucleic* acid. This belongs to the microscopic cells of the human body. It is claimed that it has much to do with the control and assembly of the characteristics which are handed down from one generation to another; and that consequently the gene-theory may have to be modified.

25. Acquired characters may only be transmitted if they are communicated to or imprinted on the nuclei of reproductive cells. One possible channel of communication is the blood-stream or the nutritive mechanism. The genes may also be modified by X rays, as suggested by experiments. Since these may either build up or break down, the genes may become more complex or more simple, according to the prevailing conditions. As a rule, an increase of com-

plexity is observed in characters that survive. So far, however, no new character beneficial to the race has been produced in the laboratory. This is a great gap in the gene theory of heredity.

26. The Evolution Theory takes its stand mainly on two principles: (1) Matter subjected to external forces is liable to change in a manner that may be attributed to 'Chance', one such change resulting in the appearance of a cell able to reproduce itself; (2) by the operation of Natural Selection is determined the racial survival of the organisms best suited to the environment.

27. This theory ignores or belittles several remarkable gaps. The peculiar properties of reproduction, of nutrition, (of which osmosis is certainly not the whole explanation, of growth, of excretion, of repair, of movement, are not explained by just saying that they arise out of the complexity of the organism; nor is consciousness or sensation explained by calling it a 'response' to a 'stimulus' or only a type of reactivity; nor again intelligence and willing.

28. We began this chapter with a reference to the significance of verbal expressions. The comparison with a living thing becomes clear, when we see that cells in a complex living organism get their function from their position and integration in the whole—their context. However, the *general* function of a cell as such does not *arise* from this context. It derives from the relations within its structure and the relations of the unit to its environment, which relations are only deduced from the reactivity of the unit. The *planning* of the cell is to be attributed to a Being other than and outside of the cell itself; so also the planning of the larger organism. Its significance is given to it, and does not arise of itself.

29. I came across this statement in a scientific

book: "A muscular system is useless without a system of control; and *consequently* nature has evolved the nervous system". Similar statements are to be found in other connections in works of eminent scientists. The Italics are ours. The author is personifying nature, although he does not use the capital N. He is endowing nature with the ability to reason, to *see* what is 'useful' and what is 'useless' and to direct her actions. This is the last thing the author himself would like to be accused of, since he clearly says elsewhere that the laws of material things together with the 'operation' of Natural Selection are sufficient to account for Evolution—the history of matter. Such scientists—and there are many—ought not to write loosely or even metaphorically. If they do, it is always to slur over a difficulty and to carry the reader with them to some point they wish to present in really scientific garb. 'Laws' should also 'evolve', according to them, and arise out of evolving matter, from, say, their increasing complexity. Why make implications and speak in a manner which others will readily accept and then go to great pains to contradict those very implications? Was a muscular system useless before Nature evolved a nervous system, or after? If *before*, then some Intelligence was at work, and we can understand the world 'consequently'; if *after*, the term 'useless' and 'useful' 'necessary' and 'unnecessary' have no meaning. Scientists lose their bearings when they are obsessed by certain philosophical notions, ('sub-consciously', perhaps), influencing their judgments. If, on the other hand, 'laws' evolve, then how can there be Natural Selection before the 'law' of Natural Selection was evolved? If the laws existed before matter took its present form, then Where? In some Being, of course. Nor can the laws be *descriptive* of material forms not yet existing; they must have been *directive* of them.

30. Haeckel's "Law of Ontogenesis", that the young creature in the mother's womb climbs its own

ancestral tree from a fish-like form through various stages up to its full development as a human being, is as little based on fact as the Evolution Theory is. Some psychologists were carried away by the same analogy : they asserted that the mental development of the child reproduces the mental development of the race from the state of the 'cave-man' to that of modern civilised man.

31. From all that we have already said Life is in many senses a Miracle indeed!

CHAPTER III

PHYSIOLOGICAL MOVEMENTS

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1. *Sensation* is a mode of consciousness. Consciousness itself cannot be defined—it is a FACT. Neither can sensation be defined. It is a reactivity of the composite living unit experienced by itself. In the process there is a sufficieat intensity of contact with something external acting on a special portion of the organism, which portion has a structure of its own subordinated to that of the whole, called a *sense-organ*. The reaction of the sense-organ, an "excitation", is transmitted in some way—say a series of molecular or electrical disturbances or "impulses"—to the brain, which in turn reacts; whereupon the phenomenon of sensation is experienced by the living organism. The capacity of the organism to experience sensation is called *sensibility*, and the living thing is said to be *sensient* or *sensitive*.

2. Sensations themselves are distinguished into several kinds, not only because the experiences seem to be very different, but also because they are

connected with different sense-organs or distinct parts of them. The capacity of a sentient being for a particular sort of sensation is called a *sense*.

3. Every part of the body is made up of or has been built up by cells. Muscles, viscera and controlling nerves are cells, the bones are the petrified calcine exudations of certain cells. Some cells are reactive to changes of sound, some to changes of pressure, some to changes in the solution with which they are in contact. The receiving sense-organs, the *receptors*, are in direct connection with the nervous system. There is an apparatus also by which we adjust our posture. We have a "sense of posture". The apparatus consists of a set of semi-circular canals in in the ear-apparatus, each in a plane at right angles to the other two. At the common base of the three canals there are limestone particles. The pressure of these against hair-cells in the three canals, when in a steady position, communicated to the brain, gives the sensation by which we experience our posture. The ratio of the three pressures is related to the amount of turning or change of direction; their intensities to the rate of turning.

4. There is also a spiral tube, the *cochlea*, by which sound is detected. The ear-drum receives sound waves, which are transmitted by a lever-apparatus to another membrane in contact with fluid. The impulses in this fluid make fibres in the cochlea vibrate, and the message is sent on to the brain. The same fluid functions in the posture apparatus. Thus the ear performs two functions: the detection of sounds and of changes in the posture.

5. The receptors respond to changes in the environment and transmit impulses through the nerves to the brain. These are the *afferent* or *sensory* nerves. Impulses sent from the brain to the muscles come through another system of nerve-fibres, the *efferent* or

motor nerves. Nerve-fibres transmit messages in one direction only.

6. Impulses from different receptors go to different portions, "areas", of the brain; and these have been located. The localisation has been arrived at by consideration of the effects of damage to brains, (*e.g.*, in war casualties), as well as by experiments on animals. Most of the work associated with thinking and speaking is done by one side of the brain. A more interesting fact is that if damage to the visual areas does not extend further, the person retains his ***visual memory***, *i.e.*, he is able to recall pictures of persons and things as he saw them before the accident. Again, when there is damage to the areas adjacent to a certain sensory area, sensations corresponding to this area cannot be co-ordinated. For thinking, such a co-ordination is necessary, *i.e.*, for putting them into a psychical ***plan***.

7. A muscle is a collection of innumerable cells, whose function is movement. Each cell has the quality of changing its shape rapidly, as when the muscle contracts. Damage may be done by too rapid a movement by which cells may be torn up or groups of cells torn apart. The muscles contribute about half the total weight of the human body. The external muscles are specially adapted for speed; the larger ones being necessarily slower than the smaller ones. The internal muscles do their work in general more slowly, *e.g.*, the stomach muscles do the work of supplying food at a speed commensurate with the process of assimilation. The muscles which work quickly, *e.g.*, the external ones, are of fibrous appearance consisting of millions of long thin cells each able to alter its shape rapidly; those which work slowly, *e.g.*, operating the intestines, are smooth in appearance, consisting of shorter cells not adapted to rapid changes.

8. In changing shape considerable energy is

involved. When stimulated to contract, a muscle gives out mechanical energy. If the contraction is prevented, the energy appears as a rise in temperature, which is measurable. It has been found that the amount of heat liberated is equal to that evolved by the different chemical changes in the constitution of the muscle. This would show that vital activity is subject to the quantitive laws of inanimate matter and that it has non-quantitive qualities in addition. It cannot ever be said that living things behave in a manner not in agreement with physical laws. It would be absurd to expect it. Even if *life* were only a power of co-ordinating material energies, it cannot be measured.

9. The muscle-cells contain large quantities of a substance called *glycogen*. When the muscle works, the glycogen breaks up into lactic acid and releases energy. The presence of the lactic acid is connected with the feeling of *fatigue*. The energy required to reconvert the lactic acid into glycogen is supplied by the oxidation of some of the remaining glycogen. Thus, some glycogen is used up rapidly in muscular activity, and some slowly during recovery, when that used up previously is replaced.

10. Fatigue is a feeling associated with the difficulty of moving one's muscles. The lactic acid seems to render the muscles unable to receive messages from the brain, thus inducing a sort of temporary paralysis. The carbon dioxide formed in the oxidation of glycogen is carried away by the blood. When too much of it is discharged into the blood and carried to the brain, the lungs are moved to breathe more quickly.

11. No satisfactory scientific reason has yet been agreed upon for the property that muscular cells have of changing their shape rapidly; whether it be due to a change in the absorbent nature of their surfaces, or

to osmosis, or to a molecular change in structure as occurs in the extension of india-rubber. Is this also a non-quantitative vital quality ?

12. The muscular system is controlled by the *nervous system*. This may be likened to a telephone system. The nerves consist of bundles, or threads, of very fine fibres, branching out into all parts of the body. These are the lines of conduction. They proceed from the spinal-cord or brain. In the cord and brain are the nuclei of the nerve-cells, one between every two vertebrae, out of which the threads grow out, sometimes several yards long. If a nerve thread is cut, the part disconnected with the nucleus dies out. The remaining part sometimes sprouts out again along the channel formerly occupied by the dismembered part. A human nerve fibre conducts an electrical disturbance at a speed of about 400 feet per second. (Electric waves travel at 186,000 miles per second.) The temperature of a nerve thread is sensibly raised in the process. Hence it is reasonable to consider the impulses transmitted by nerves to be not merely of an electrical, but also of a chemical nature.

13. Each impluse is within a single cell which extends from the spinal cord to all the branching fibres with the nucleus in the cord. The cord is like the telephone exchange, to which all parts of the body are connected.

14. Muscle-cells, heart-cells, and eye- and gland-cells also show electro-chemical action. Currents have actually been registered experimentally. The electrical properties of cells have been attributed to the ionization of salts in solution. The skin of the cell is a sort of semi-porous membrance through which electrically charged atoms in solution within the cell find their way to the corresponding terminals from a battery when the potential difference is high enough. This

probably accounts for twitching, and the movement of the ions is due to such a stimulus. The sudden change of electrical pressure at some point of the nerve-fibre, due to a mild electric shock applied or locally generated by chemical action, brings about a readjustment of the ions. The impulse is a wave travelling along the nerve, readjusting the electrical relations between the ions.

15. Muscles are all connected by nerves to the spinal cord and brain. Through a nerve comes the impulse to contract. The contraction is followed by a relaxation. Both contraction and relaxation take time. To keep a muscle almost steadily contracted a series of impulses must arrive so rapidly as to give no time for the muscle to relax appreciably, say at fifty impulses to the second. When the excess of lactic acid in the muscular cells interfere with the passage of the stimulating current or "impulse", the muscle is "fatigued". Possibly the conductivity of the surfaces of the muscle-cells is altered, and thus the impulse does not pass on to them.

16. There are two sorts of stimuli to which the heart muscles respond. On an exciting occasion impulses are sent from the brain directly to the heart making it beat faster; simultaneously they are sent also to certain glands which secrete certain chemicals directly into the blood stream, and when the blood reaches the heart these chemicals in it also stimulate the heart action. Certain glands near the kidneys when stimulated discharge *adrenalin* into the blood. The speeding up and strengthening of the heart-beat increases the blood-supply to the muscles and the brain, and so makes for greater effort and external activity.

17. Electrical changes in the body produced by sudden emotions have been demonstrated. Each of a person's hands is dipped into a vessel containing a

solution of common salt. The two solutions are connected by wire with a delicate galvanometer in the circuit. If anything is mentioned that excites the person, a current is produced two or three seconds later as shown by the deflection of the galvanometer. This apparatus has been used to study the emotions and even to examine a person's veracity or connection with crime or secret interests. (Conclusions from observations, however, are not to be indulged in hastily, for there are many factors hidden from the observer.)

18. The *thyroid gland* in the neck, secretes a substance *thyroxin* into the blood. Its molecule contains four atoms of iodine. Men deficient in iodine become idiotic or cretinous. Other animals also need iodine. Thyroxin helps to oxidise sugar in the blood and stimulates growth. The *pituitary gland* in the head secretes a substance which also stimulates growth, and another substance, *pituitrin*, which stimulates the uterus. The sexual glands also secrete into the blood stream and stimulate sexuality. Change of sex has long been known in nature, and can even be artificially brought about.

19. External movement sometimes follows a sensation. One impulse goes to the brain, resulting in sensation; one comes from the brain, resulting in muscular movement. When nerves that carry messages from a sense-organ to the brain are damaged, the person is incapable of the corresponding species of sensation. When nerves carrying messages from the brain to a muscle are damaged, there will be a paralysis. No doubt electro-chemical changes occur in the brain. Evidently sensation is a conscious mode of experiencing some physiological event. It would be absurd to reduce the sensation to this event. Over and above its physical or electro-chemical qualities is another quality which is particularly implied in the term "sensation". Although the physiological action

of sensation is ultimately traced to the brain, yet the sensation is referred to the place of origin. This would confirm what we said above. Sensation, *e.g.*, pain, is not the occurrence in the brain alone: it is our mode of experience of a more wide-spread event, including processes in the sense-organ and the different nerves. Suppose a stimulus is given directly to the afferent nerve without the intermediary of the sense-organ, *e.g.*, an electric shock to the nerve-endings in the retina, the impulse is conveyed to the brain and sensation refers it to the eye. This does not militate against what we have said. The person "sees" a "flash of light"; he may even say "with my own eyes". The sensation is the experience of the whole occurrence. The reference is not to the orb of the eye. Even if it were, it would be by a psychological as well as a physiological habit; just as when the visual area of the brain is damaged the person is still able to recall *visual images*. In fact when dreaming, we "see" persons and things without any activity of the visual organs. Again, a man who has had a leg amputated may still feel a pain as if in his leg, or even in his toe. It is due to a stimulation of the nerve-ending which would have continued on to his toe, *e g.*, an irritation due to a tumour. The sensation is of the whole occurrence from the brain to the nerve-ending. That it is referred to the non-existent toe is due to the physiological habit. Such references are not "illusions" in the proper sense of this term. They occur only in cases where a person has previously enjoyed the use of the part in question. No one born without a toe feels a pain in the missing toe, just as no one has a sensation outside his body. A physiological habit, or occurrence tending to repetition, is dependent not only on the afferent nerves and cerebral area corresponding to that species of sensation but also on contiguous areas, and is acquired by the whole.

20. With regard to *hallucination*, it may be said

that it certainly corresponds to a physiological process; only the psychological reference to an external entity existing as "seen" is false. Two observations are noteworthy in this connection. Just as the corrective to an individual's impressions is to be had in those of others in society, thus ensuring objectivity, so also the corrective to perception through one sense is to be had in the other senses. A co-ordination of sense-perceptions is required; without it there can be no thinking, which consists essentially in *planning* or *relating*. Again, the very fact that hallucination is possible would also show that a mental process is something, not other, but more than a merely physiological process, and that man is a unit operating as one, not a loose combination of "matter" and "spirit".

21. The Brain is divided into several portions. The largest portion, exceeding in size all the rest together, occupies the highest part of the skull or cranium. It is the *cerebrum* or *cerebral cortex*. Its surface is a grey mass of millions of cells, while its interior is a white mass of nerve-fibres. The surface area is crumpled with a number of furrows. The largest divides the cranium into two parts, called *hemispheres*. Lesser furrows sub-divide each hemisphere into *lobes* or *districts*, each containing several convolutions. The number of cells in the grey matter is between one and ten millions. They do not multiply during life, the adult having the same number as when he was just born. They only get more complex, accumulating fat and debris until they deteriorate in action late in life. The function of the cerebrum seems to be connected with co-ordinating the actions of the whole.

22. The next prominent portion of the brain is the *cerebellum*, occupying the lowest part of the back of the skull. It is a large laminated mass. Its outer surface is made up of layers of cells, with some groups of cells within and large bundles of fibres connecting the cells with the rest of the brain. It plays an important part in co-ordinating locomotive action.

23. Next to, and in front of, the cerebellum is the terminal of the spinal cord, which projects in the cranium and widens out. It is the *Medulla Oblongata.* It is also made up of nerve-cells and fibres. Its function is to control the breathing and eating apparatus, and also the heart and the face muscles.

24. Above, and in front of, the medulla oblongata is a mass of fibrous matter joining it to the cerebrum. It gets its name, *pons varolii*, or "the Bridge", from its shape and position.

25. Alongside the Bridge, connected with it, are two glands, the *Pineal Gland* at the back and the *Pituitary Gland* in front, of which we have already spoken. Descartes thought that the pineal gland was the seat of the Soul, prabably because it was in the middle and innermost part of the whole brain structure. It secretes a fluid into the blood stream. Evolutionists regard it as the vestige of a third eye which is sometimes found in lower animals, *e.g.*, some reptiles.

26. The human brain has billions of tiny storage batteries, each yielding a minute current of electricity. Experts tell us that the amount of electrical energy generated in different parts of the brain is connected with our nervous health, also with our actual mental processes. The discovery that electrial energy was produced by the brain, was made at the end of the last century. Some even said that Telepathy was a communication of thought by Hertzian waves.

27. The great difficulty was to find instruments sufficiently sensitive to record the changes in the minute quantities of electricity. The experiment of fixing an aerial very close to a patient's head and then making him excited, showed definitely that electricity was radiated; the delicate test instruments recorded a considerable quantity of electrical energy produced.

With the production of cathode-ray tubes for television came the possibility of making a sensitive instrument that gives records of these processes for comparison purposes. The new apparatus devised is called the *electro-encephalogram.* It is an ingenious adaptation of radio amplifiers and the ray tube for recording nervous energy. It is used to find out what is wrong with the nervous system and whether the brain is functioning properly and which parts are not working normally.

28. The patient's head is swabbed in several places with cotton-wool soaked in alcohol, and the spots moistened with a solution of common salt. The contacts are made and kept in position by a sort of head-dress. The contacts are in two pairs, the wires leading from each being connected with an amplifier. The electromotive forces vary from a thousandth to a two-hundred-thousandth part of a volt. It is amplified ten million times before it reaches the oscillograph, where its variations are made visible on a fluoroscent screen as wavy lines by the blue light of the cathode ray tube of the instrument. The two pairs of contacts are used simultaneously so that electrical impulses from two different parts of the brain can be recorded together. Two separate wavy lines are seen, one above the other. By examining the patterns, the doctor is able to say whether the patient's brain is working normally or not. When treatment is indicated, permanent records are made either by photography or by pens on paper on which the waves are traced by the ink-writing oscillograph. The patterns of the wavy lines change with the changes in the brain activity of the patient.

29. The electro-encephalogram has shown that brain-wave patterns are peculiar to individuals, showing up characteristics as distinctive as finger-prints. It is at present largely used for studying such ailments as epilepsy and hysterical fits.

30. Again, the activity of the neural paths has been deeply studied. The brain sends a message to a muscle, say in the feet, through a series of nerve cells. These are separated by tiny gaps. Across these gaps, the electrical impulses flow by the presence of *acetylcholine*. It is the master chemical in our bodies, absolutely vital for the transmission of nerve impulses, one way or the other. It transfers their energy from nerve to nerve, from nerve to muscle, and from nerve to gland.

31. When certain cerebro-neural areas are damaged, nature has a trick of making new pathways. The trick is a general one of co-ordinating and unifying what is left of the organism.

32. The late celebrated Indian Scientist, Sir J. C. Bose, devised apparatus to record shiverings and similar vital reactions of plants under certain externally imposed conditions. He thought that he had demonstrated the fact that plants had sensations just like animals, in spite of the patent fact that they had no organic structure for the purpose. If such, however, could be deemed sensations, it is no wonder that brain-reactions could themselves be regarded as reasoning, judgment, contemplation, willing

33. There are many movements going on in the body of which we are never conscious, *e.g.*, digestion. These are *automatic* movements. There are some movements of which we may be conscious though not consciously directive of them. Thus when one has a sensation and a movement promptly results, the impulse sent to the nerve-centre is promptly followed by one sent back (as it were, by reflexion), along a motor-nerve, not as the result of consciousness, *e.g.*, moving a finger away when it touches something very hot. This is 'reflex action,' or a *reflex*. Such actions are natural, but some consciously directed sensori-motor actions become *habitual* and tend to become reflexive

also in character. In reflex action there may be movement in response to a stimulus without the operation of the brain. The whole may be local in character, the centre of operation being the spinal cord or some inferior centre. Thus, even though the spine may be broken, tickling the sole of the foot induces convulsive movement.

34. It was Descartes who first had a notion of a reflex. In his *Tractatus de Homine* he described and illustrated with a drawing the passage of a nervous impulse starting in the eye by the sight of an object along the optic nerve right up to the pineal gland. In this gland, Descartes believed, resided the soul. The gland was a sort of a mirror that could be turned about by the soul and 'reflect' in the proper direction according to its needs the force that caused movement, *e.g.*, of the hand. This notion of Descartes was due to common experience of automatic actions in which there was no consciousness, and to speculation. If we leave out the idea of the soul manipulating the pineal gland to direct its power, we have a notion very like that commonly held today in physiology.

35. A reflex is a 'regular response of the organism to the excitation of some sensory field without the intervention either of conscious directive activity or of consciousness'. Its anatomical mechanism consists of a sensory field or sense-organ, a nerve-path leading from it to a nerve-centre, some sort of nervous connection between this centre and another, a nerve-path from the latter along which an impulse is sent outwards to the organ of response, and this organ of response itself. We have already referred to the importance of acetylcholine in this connection.

36. The reflex was for a long time considered as a rigid formula of physiological action. Recently it has been shown that even the simple or 'elementary' reflexes are not such rigid mechanisms as they were

held to be. There is now talk of the 'plasticity of the nervous system'. It is found that even an impaired brain is capable of adjusting its functions to altered conditions. It is even held that a reflex is changed when the total situation of the organism is altered.

37. About the year 1800, Gall, an anatomist with an original bent of mind, thought he saw a connection between the mental peculiarities of certain individuals and the peculiar shapes of their heads. He believed that both the mental traits as well as the external shape of the skull were due to unequal development of different parts (lobes) of the brain. He invented *phrenology*, 'the study of the external conformation of the cranium as an index to development and position of organs, belonging to various mental faculties'. It was a psychological craniology, and subject to ridicule as the study of the 'bumps' of the skull. Gall held that it was possible to apportion out different cerebral areas to the various mental faculties and qualities: acquisitiveness, wit, friendliness, reverence, language, number, etc. His scheme of localized organs could not be verified. About 1825, Flourens declared against any such scheme, saying that the brain functioned as a whole. The idea, however, did not die out. About 1870 physiologists were able to connect up certain cerebral areas with certain functions; not, however, resembling any list made up by the phrenologists. By the end of the century by the study of brain lesions in man and by operative surgery on animals, it was definitely established that the major senses were dependent on certain definite areas of the cortex. They were called 'sensory areas'. 'Motor areas' were also discovered. Complete destruction of a sensory or of a motor area would result in complete loss of the corresponding sensation or in motor paralysis of some kind. In the Great War of 1914—18, injuries inflicted by shrapnel and bullet gave ample opportunity for studying functional localization, and more detailed results were obtained. These referred

only to sensory and motor functions. It was held that the higher functions would also be localized in time, perhaps in the remaining portions of the cortex.

38. The American S. I. Franz (b. 1874), a psychologist who had studied physiology intensively, in the first few years of the present century, combined Thorndike's method of training an animal and testing its ability to learn or unlearn or relearn with the physiological method ofremoving definite portions of the brain. Working on monkeys and cats, as Thorndike did, he found that, though the removal of a lobe resulted in the loss of certain learned reactions, yet it did not render the animal incapable of relearning the same tricks.

39. K.S. Lashley (b. 1890), Franz's young collaborator, continued the work. He used the same methods on white rats. His researchs showed that, in spite of the slowing up of the rat's rate of learning following the loss of a portion, small or even considerable, of the brain, it did not seem to matter which portion had been extirpated. Moreover, the simple tricks could still be learnt even with about half the cortex left; the difficult ones could not. Lashley enunciated two principles as the result of his findings, the Principle of Equipotentiality and the Principle of Mass-action.

40. The principle of Equipotentiality states that, excluding the sensory and motor areas, any portion of the cortex is potentially able to take part in any sort of learning as any other portion.

41. The principle of Mass-action states that the cortex operates as a whole, and that the more cortex there is available the more effective is the operation and the quicker is the animal at learning.

42. The latter principle does not altogether exclude localization, for it is meant to state only that

the dynamic system is of a pattern including all the parts and not confined to a strictly circumscribed part. Lashley's rats which had learned to run through a simple maze were able to do so even after they had been deprived by surgical operation of the major senses of sight, smell, hearing and a good deal of touch. Further, the removal of the muscle—which Lashley ingeniously effected by interrupting the conduction path in the spinal cord—did not prevent the rats from getting through the maze as before. Lashley, therefore, could not accept the simple reflex arc as the functional unit of brain activity, nor could he see how the conditioned reflex or the conditioned reflex chain could alone account for every sort of learning. These recent discoveries of Lashley have induced many Behaviourists to give up some of Watson's doctrines and lean markedly towards Gestaltism. This alone would show that Watson's dectrines were not founded altogther on objective evidence, but arose a great deal from speculation.

43. About the year 1905, a great discovery was made, for which the Russians, Bechterev and Pavlov, were independently responsible.. It is claimed that the discovery was made simultaneously in the U.S.A. by E. B. Twitmyer of Pennsylvania.

44. Bechterev (1857—1927) begin his investigations as a young man at a laboratory in St. Petersburg (Leningrad) on the anatomy and pathology of the nervous system and on reflexes in connection with his work on the neuroses and the psychoses. The reflexes he examined were motor ones. He came to the conclusion that reflexes could be associated. He showed that a stimulus brought forth a natural reflex response, and that if another stimulus which by itself had no such response be simultaneously applied along with the other, and if this process be repeated often enough, then when the second stimulus was applied alone it would call up the reflex natural to the

other. This reflex was called by Bechterev a 'learned' or 'associated' reflex. This was the main result of Bechterev in his work both on animal and human subjects. He claimed to have a thoroughly objective psychology and to have established the science of 'reflexology.' Using the reflex as the functional unit he endeavoured to explain all psychological behaviour in terms of it. He avoided also all reference to sensation, feeling and thought. His chief work *Objective Psychology* was first published in Russian in 1907. Translations into other languages appeared slowly, first in German and much later in English.

45. I. P. Pavlov (1849—1939) also studied and worked in St. Petersburg in a rival laboratory. He had first studied for the priesthood, then he turned to medicine and lastly to physiology. He was particularly interested in digestion, and was investigating the secretion of saliva in the dog. By an ingenious device, he was able to collect the saliva secreted from one of the dog's salivary glands. He noted that salivation began even before the food was in the dog's mouth, before even it could see or smell the food; it started at the approach of the attendant who repeatedly brought the food, or at the sound of his footsteps, or even at some preliminary signal, *e.g.* the sound of a bell, announcing the meal. Such a stimulus could hardly by itself call forth the response natural to the presence of food in the mouth. Pavlov considered it as an important example of adaptation to environment, and also as a cue to the study of other brain functions. By assiduous protracted labour, he established firstly the fact of what he called 'conditioned reflex'. It was a reflex response to a stimulus to which it was not natural but with which it had somehow become attached. (Bechterev's 'associated reflex'). He discovered processes of conditioning a reflex and also of extinguishing a conditioned reflex. If he preceded the putting of food in a dog's mouth by the sound of a metronome ticking for a minute,

and repeated this process several times every fifteen minutes, the saliva would begin to flow soon after the ticking started. Thus the dog's salivation would be conditioned. Suppose the conditioned reflex had been thus established, the metrenome be now started and food not given; when it stops the salivation is still at first considerable, but diminishes as this disappointment is repeated, and after a few trials the conditioned reflex previously established is extinguished. Again, if a conditioned reflex is established on one day and discontinued for twelve hours, when the signal is again given, there may be no response at first, but fewer trials are needed to re-establish each day the reflex once more. If this experiment were repeated over and over again, the re-establishment gets quicker and quicker until one morning the response is prompt and found to be firmly established. On the other hand, the more firmly a conditioned reflex is established, the longer does the extinguishing process take. Moreover, it is only temporary at first; for, though apparently extinguished after many trials on the first day, yet it reappears on the next and the next; but the extinguishing trials need to be less and less in number, and if persisted in for a number of days, the reflex is at length permanently extinguished. Thus the process of extinguishing a conditioned reflex is the reverse of that of establishing it. Pavlov concluded that conditioning was equally effected by the same brain mechanism, whether it were a positive response or a negative one.

46. Pavlov and his pupils also experimented on 'differentiation.' Two simple stimuli were applied, the dog's positive response being established to one of them and its negative response to the other, the stimuli differing only in some fine quality. Thus he conditioned a dog to respond positively to a definite note sounded on a tuning fork. Then he used a tuning fork with a considerably higher note not followed by food, whereas

the fixed note regularly preceded food. At first saliva flowed even at the sound of the higher note, showing that the reflex held for the similar stimulus. After some days, the dog responded positively to the fixed note and negatively to the higher one. The next stage was to lower the pitch of the higher note so as to make it nearer and nearer to the lower one, gradually, day by day, in order to discover the limits of fine differentiation in the dog. He found that the dog could differentiate between sounds differing by less than a semitone. If the experiment was carried too far, the conditioned responses were all extinguished. Pavlov said that the dog became a neurotic.

47. Such an experiment takes months to complete. Moreover, there are several factors not taken into account, *e.g.*, the experimenter's unwitting external expressions and perhaps certain subtle unconscious movements. Experiments are now being made avoiding all such influences. The results have yet to be confirmed by large numbers of workers working independently in different laboratories.

48. As a result of his investigations, Pavlov made up a theory of the functions of the brain. The activity is twofold. On the sensory side, there is a selection of particular stimuli from the host of physical impressions on the organism made from outside. On the motor side, there are reflexes and conditioned reflexes by which all behaviour is governed. The conditioning is effected by the cerebrum itself. That this is so, says Pavlov, is shown by the impossibility of conditioning an animal which has suffered an extensive injury to the cerebrum. The findings of Lashley, referred to above, may be compared with this. Pavlov never claimed to be a psychologist.

49. Soviet physiologists have been investigating the effects of electricity on nerve and muscle as well as electrical phenomena connected with their movements

and with fatigue. Galvanic reflexes are recorded during physical activity and the period of restitution. The Krogh ergometer is used for this. Vasilievsky has suggested that the nervous system acts on the motor system and brings about a change in the organism's need for oxygen.

50. The complicated behaviour of man is associated with the activities of the whole organism, of which the brain and nervous system is a most important part. Very little is known of what goes on in the brain, but this little has given occasion to considerable speculation. Most vociferous are those who claim that human behaviour has been 'explained' and in particular that 'free will' is a fiction. Their prime argument runs as follows :— "There is strong temptation to accept the opinion of those who believe that personality is directed by a free will. If this were true, the operations of the brain, in so far as they were a correlate of intelligent behaviour, would be forever inscrutable, since it is necessarily impossible to discover the laws governing a *lawless will*. In fact, if the will were free, it is difficult to see why brains should exist. An organism possessing freewill can have no use for any mechanism in the control of its behaviour, because its behaviour is uncontrolled. If behaviour were free and above control no control centre and therefore no brain would be necessary." (J.G. Crowther in "*An Outline of the Universe*".)

51. To get such an argument from a scientist is astounding. This would show how much a scientist loses his bearings when he gets off his appointed track. The very first sentence takes an unfair advantage of the common man. He is made to think that he has been induced to adopt the opinion of a nefarious set of philosophers, and to forget that in innumerable instances he acts with the implication that he is freely directive of his operations, that he holds others

responsible for their actions, and that he is aware of his freedom of action. As regards the "temptation", it is none other than the *Feeling of Freedom* explained elsewhere. The remaining parts of the question are mere statement; they refuse to be put into syllogistic form. The most important premises are wanting. More than this, there is misconception, if not another misrepresentation. By "personality" is probably meant "individual behaviour." Let us put the first argument, which is a *reductio ad absurdum*, in a simpler form: "It is impossible to discover the laws governing a lawless will. The operations of the brain are the correlate of intelligent behaviour, *i.e.*, behaviour directed by the will. Therefore, it is impossible to discover the laws of operations of the brain." If anyone can put it into a better syllogistic form he may do so, but I am sure he will not follow out the argument. Without pointing out flaws in the logic, it is sufficient to observe that the "will" may only direct *in accordance with* the laws of operations of the brain; and so the conclusion would not follow. Life is held to be some principle directing the physico-chemical potentialities of a body. Even if it be considered—as it ought to be—an abstraction, or rather an aspect peculiar to one class of beings by which they are distinguished from another, the "lifeless" class, we are not to understand that this aspect contradicts the other aspects, and that life *upsets* the "laws" of inanimate nature. The "laws" of material bodies hold even for living things whose behaviour exhibit a quality superimposed on the qualities of inanimate behaviour. So it is also with sensitive life, which is an aspect that the behaviour of animal life bears over and above the vital and material aspects. So also with human life, which is a quality that human behaviour manifests over and above animal behaviour. The will does not alter the nature of this behaviour by directing it.

52. A most important point to be noted is that

"will" is not a separate or separable entity externally directing human behaviour. If we speak of the "will" it is by abstraction, just as we speak of "force". We can only mean that human behaviour exhibits the special quality of being directed consciously. If Will were an entity by itself, (I am sure Prof. J. G. Crowther does not accept this), we may speak of it as "lawless". Even then it would be wrong to extend this term to the behaviour which it directs, so as to get a *reductio ad absurdum*. Physiological laws, whatever they are, are not only restrictive of the "freedom" of the Will but also show paths along which direction may take place. The strongest volition will not make a deaf man hear.

53. With all our knowledge of the operations of the brain—and a great deal of it has been got by experiments on the reactivity of dogs—human behaviour *as such*, *i.e.* distinctively human, is unpredictable. It is because physical impulses do not inexorably necessitate a particular mode of action that concious behaviour can be directed consciously. Thus, although we have discovered "laws" of physiological activity, it would be presumptive to say that we have discovered "laws" of human behaviour. Automatic actions, reflex actions, conditioned responses, etc., are not distinctively human.

54. It will be now clear that the second argument of Prof. Crowther is due to a misunderstanding. More than this, it also involves a contradiction. "Behaviour controlled by the 'will' is uncontrolled, because the will is uncontrolled". How would the following statement be viewed: "The behaviour of molecules controlled by 'life' is uncontrolled, because 'life' is not controlled by the laws of molecules?" Or this: "Because life is not controlled by the laws of molecules, therefore life has no use for molecules?" It is astonishing that such one-premiss arguments are put forward by eminent thinkers!

55. We shall discuss free-will in greater detail in a later chapter.

56. In our own days we have seen many startling scientific discoveries and more astounding inventions based on them. In connection with our topic we are concerned with apparatus with functions analogous to those of the human organs.

57. In 1897 Sir J. J. Thomson discovered the behaviour of what came to be known as 'electrons,' those particles of negative electricity that do not need wires to travel along. They could be projected through tenuous gas or across a vacuum. The result of researches gave us tube-lighting, the thermionic valve, the radio, and other modern amenities. Thomson discovered the reason why certain elements glow when light falls on them. This led to the invention of photo-electric cells and the talkies, and the conversion of sound effects into light effects, and *vice-versa*.

58. An apparatus has been devised for tasting. So far its electronic taste or telegustation is confined only to that of sourness. It screams when the electrode is pushed into a sour apple. This is only a very complicated substitute for a bit of litmus paper.

59. Electronic smell or teleolfaction has not yet succeeded. Perhaps in the near future some device may be invented to detect smells and to transmit them across thousands of miles.

60. Teletaction or electronic touch may also one day be a possibility, so that an apparatus will detect for us the same properties as our sense of touch does and transmit them across space.

61. For electronic hearing we have the microphone. Electronic vision is given to us by the photo-electric cell, the electric eye. This is highly specialised,

and a vast combination of them would be needed to do all that the human eye does.

62. Electronic memory or memex is effected by the micro-film, which could record and reproduce at will — the willing of the operator — any book or piece of music or conversation you would like to hear.

63. We have also the electronic voice in the radio. Moreover, sound waves can be converted into recorded light waves and these reconverted into sound. Thus the stone-deaf may be able to 'see' sounds and in course of time to read them. A zig-zag line on the cinema sound-film is the graph of the sound.

64. Electronic Inspectors can detect flaws too fine for the human senses of sight or sound; Electronic Stokers can control the heat of a furnace with an exactness not possible to unaided man, reacting to the most minute changes in temperature.

65. We have also the Electronic Brain, which can work out in a fraction of a second arithmetical problems such as would worry the most efficient chartered accountant. Of course, we had already non-electronic apparatus such as automatic cash registers, comptometers, speedometers, and the like, and, further back, the slide-rule, not to mention ready-reckoners, mathematical tables, etc. It is stated that the Electronic Brain can reproduce many of the automatic functions of the human brain, *e.g.*, that it has 'reflexes,' and may be 'conditioned'; that it exhibits 'primitive instincts', 'brain-storms', and 'neuroses'. It employs 18,000 interacting valves, which may be compared in number to the twelve thousand million interacting valves or microscopic cells of the brain.

66. Thus we have finally built up a Robot Man, which is said to reproduce many of the operations of

man. But it is after all a super-machine, planned by man, purposed by man, controlled by man; and calling it 'man' is only by a metaphor. It is merely a labour-saving device, saving us the expenditure of a great deal of physical energy. But its structure, its functions, its efficiency, are all due to the intelligence and willing of man, subjected to his Planning and Purposing, and owing its Significance and Value to him. It is as far removed even from life as a machine ever was. The Principle of Life is wanting, which no physical contraption will ever possess.

67. We may even envisage a time when a robot man may take the place of a friend. Miss X goes to her robot and makes love to it, while it reacts exactly as her friend Mr. Y reacts to his robot two thousand miles away. Whether Miss X smells of perspiration or of Parma Violets Mr. Y's robot will smell the same; while Miss X will say: "Bill! you're smelling of liquor!" If Miss X slaps her robot Mr. Y. will be slapped by his in the same teasing way, and thereupon he will propose across the ether. His lips may also be tinged with lipstick.

68. Such inventions will eventually make quite clear and striking by contrast that stupendous phenomenon called Life and the greater marvel, Man.

CHAPTER IV

APPETITE AND MOVEMENT

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1. The term *Appetite* or *Desire* is used often in a wide sense to denote all forms of internal tendencies that impell the subject towards something, or to some movement, as well as conscious feelings of such an urge. It is generally directed towards a dynamic unification, an equilibrium within the individual or of

the individual in his environment. Objectively viewed, appetite is more remotely directed towards nutrition, growth, continued existence of the individual or of the species, internal co-ordination, etc. Subjectively, it is directed towards the realization of a definite vital value.

2. The term *appetite*, however, is more often restricted to such tendencies as they are in consciousness, and consequently not applied to the natural tendencies of vegetable life. As such it has its source in the sensitive organism, though it may show also intellectual and volitional aspects in man. The physical conditions of the body are mainly of a regularly recurring character, essential to the preservation of the individual or of the species and in some sort of agreement with the periodically recurring external processes of nature in general. They may also be irregularly recurring, owing to varying circumstances. When a movement is stimulated and set going according to a tendency, the incipient movement in consciousness may be called an *urge* or *craving*. Evidently it depends on a certain physiological state being reached. *Appetite* may be described as the mode of consciousness of a disequilibrium, in the manner of a craving for some object or of an urge towards some movement that would proximately bring about equilibrium, or internal dynamic unity, or of unity of the self with the environment. Hunger has its source in the privation of nutriment on which the appropriate functions of the alimentary canal are normally exercised. The craving for sleep is due to fatigue. The urge for physical activity is awakened by an accumulation of surplus energy. Thirst is due to a dryness in the throat passages.

3. It has been said often that the appropriate *satisfaction* of such tendencies awakens *pleasure.* Our experience does not bear this out. Pleasure is not consequent on or even simultaneous with the satisfaction. The sensations of the initial movements

are accompanied by pleasure, which intensifies the urge and heightens the disequilibrium ; the greater the intensity of the urge the greater the pleasure in the movement. It must be noted that to such movements as, even in their incipient stages as in their complete phases, are conducive to the well-being of the individual or to the species pleasure is attached. In eating or drinking pleasure accompanies the act and is not consequent on the satisfaction of the urge; the satisfaction occurs only when the stomach and alimentary tracts are again at work normally on their normal material. Pleasure accompanies taste and smell, not the passing into the gullet ; but the pleasure intensifies the urge and renders possible the act of swallowing. In sexual movements pleasure accompanies the gradual excitation up to the final culmination of the sexual act. An infant is pleasurably excited by tickling or touching its genitals. There is no question here of 'satisfaction.' Holding hands gives pleasure to lovers.

4. In certain movements the process of satisfaction takes time, *e.g.*, in eating or drinking. As the food or drink is being taken in the urge diminishes and so also the accompanying pleasure. As we examine the reactions more closely, we note that pleasure accompanies the external and the organic sensations of the preliminary movements rather than the satisfaction of the urge. The sensitivity of the external sense-organs diminishes with the duration of the sensations, and pleasure diminishes accordingly. Variety in taste and smell keeps up the sensitivity and the pleasure in the matter of food. Pickles are said to stimulate appetite. With regard to the organic, including sexual, sensations, the urge may increase with duration owing to processes taking place within, the organism getting more and more stimulated up to a maximum.

5. An excess of stimulation of the organic senses brings about disordination and ***pain***. In the case of

the organic sensations connected with nutrition, a defect of activity below a minimum in the alimentary tract is also connected with pain. The pain is organic and connected with internal muscular strain.

6. Recurring physical conditions of the body may be acquired by *habit*. Thus there is the smoking habit, the drink habit, and the drug habit. Since the organism adjusts itself in time to conditions repeated frequently, it acquires new average or normal conditions of activity, and deviation from these states occasions an urge. Man, however, can direct his life and bring about and retain a state of normal organic activity most conducive to his well-being.

7. Appetency is manifested in movement. An animal subject to an urge moves in search of food or of a mate or to build its nest or to migrate or to dance or play. Many movements are in their general outlines instinctive, though in their particular modes even among lower animals some have to be acquired. A kitten may seek for food instinctively and try to catch a small moving object for this purpose. If the smell or taste is agreeable or stimulating it will eat the object. But a kitten does not instinctively catch a rat or a bird for food. The particular kind of food to be chosen is learnt by imitation or by experience.

8. All animal organisms unconsciously perform certain vital actions normal to them, *e.g.*, the pulsations of the heart, the circulation of the blood, breathing. Such actions are called ***automatic***. They are not dependent on external stimulation. Normally they are not in consciousness and are uncontrolled. They should rather be called "reactions" than actions, as they are responses to changes in internal conditions.

9. Another class of unconscious actions are occasioned by peripheral stimulation. They are also reactions or responses to stimuli, the conciousness of

the stimulus or of the movement coming after the movement with its after-effects. There is stimulation of a particular area of the body responsive to it (the receptor organ), and an appropriately typical response without the intervention of consciousness or of the higher levels of the nervous system, such as the cerebral cortex. An afferent impulse along a nerve, the spinal cord or some inferior centre, is followed immediately by another impulse reflected along an efferent or motor nerve (without the intermediary action of the cerebral cortex), resulting in movement. Thus, tickling the sole of the foot causes convulsive movement even though the spinal cord has been damaged and the lower part of the body deprived of conscious sensibility. Such movements are called *Reflex-actions*. Winking, sneezing, swallowing, coughing, are ordinarily reflex-actions. Originally, at least, they are uncontrolled and unlearned; but they may be actively controlled by effort, and rendered volitional. Reflexes are "conducted" along definite "paths". These are fibres joining the point of stimulation with the nerve centre in the spinal cord or the brain, then back through "shunting stations" which are sometimes complicated, along a path from the centre to the effector organ, *e.g.*, a muscle, which then contracts. Thus when a sharp blow is given to the tendon of the extensor muscle of the knee, there is a sudden stretching of this muscle, giving rise to an impulse which reaches the spinal cord and is then reflected by another set of fibres bringing about a brief twitching of this muscle. (The "knee-jerk" or "patella reflex.") The narrowing of the muscle-fibres of the iris occasioned by increased illumination of the retina of the eye is another example of a reflex. The increased secretion of tears when the conjunctiva is irritated by a foreign body may also be cited. In all these cases the mechanism, the so-called "reflex arc," is assumed to be in normal working order, *i.e.*, in a condition to respond to the adequate and appropriate stimulus in a normal way. The reflex arc is brought into activity

by the stimulus and shows no urge towards activity in its absence.

10. It is generally considered that the reflex is the functional unit of nervous processes. Certain systems of Psychology (*e.g.*, Psychoanalysis), regard physiological laws as equally valid in the psychological plane, the reflexes themselves as the functional units of complex mental processes, and the way in which they combine to make up complex mental phenomena as the same as in nervous processes.

11. The notion of a reflex and a theory of it was first given by *Descartes* in his *Treatise on Man*. He describes, with a drawing, how a nervous impulse of sight is transmitted along an optic nerve to the pineal gland, the "seat of the soul." The gland is a sort of mirror which turns according to the needs of the organism and reflects the energy in the proper direction causing appropriate movement, *e.g.*, of the hand. With no knowledge of nervous physiology, Descartes had derived his notion of the mechanism of immediate responsive action from introspection. Nowadays the explanation of action in terms of brain physiology starts from experimental facts, and fits in with introspective data.

12. In the last century, Materialism and Determinism were in the ascendency. The explanation of mental facts was sought in the physiology of the nervous system. Some baldly asserted that the brain "secreted" thoughts just as the kidney secreted urine. In general, mental facts were accepted as manifestations of brain processes, or rather as identical with them, being but the internal aspects of changes which would appear to the "external" observer as physical and anatomical.

13. In the third quarter of the century research was conducted in most clinics on "localization" of

mental operations in the brain. It started on the causes of disturbances of speech, later called *aphasia*, a state of inability to form words in spite of understanding speech and knowing what one wants to say and of the fitness of the vocal organs. In 1861 it was demonstrated by dissection that to a certain defect of speech there was a corresponding localized lesion of the brain. In 1870 another discovery was made; localized stimulations of the cortical surface result in the contraction of definite muscles, each muscle corresponding to a definite spot on the cortex.

14. Wernicke developed a theory of aphasia. The process of speech was to be described in terms of the reflex, *i.e.*, a regular response of the organism to sensory stimulus without the intervention of consciousness. A reflex was conceived as an absolutely rigid behaviour. Wernicke described the reflex mechanism. He generalized his reflex theory of speech, and conceived of mental responses to mental stimuli as exactly of the same pattern, indeed as identical with reflexes. Thus a reply given by a man is the reflex response to a question, which is the stimulus. All human action likewise, however complicated, can be explained in terms of the reflex as it is known in the study of animals.

15. If in Descartes' conception, the notion of the soul manipulating the pineal gland and so directing the reflection, be left out, his mechanism is precisely the modern "reflex arc."

16. Dr. Exner of Vienna found also that a reflex of an intensity too weak to release a reflex, may by repetition condition a reflex; if the group of muscles has been stimulated before by stimuli too weak to elicit a reaction, it may react to a stimulus proceeding by another neural pathway, even if the latter stimulus by itself were too weak to bring about a response. This has been called the phenomenon of summation of

stimuli. A reflex was conceived as due to tension resulting from the stimulus situation, and as a discharge of energy by which the tension was eased and equilibrium restored.

17. Freud distinguished *Agnosia* from *Aphasia*. Agnosia is the state of inability to understand speech in spite of the unimpaired capacity for spontaneous expression and of the fitness of the hearing apparatus. Some neurologists postulated two sorts of centres in the brain cortex, *Centres of Perception* and *Centres of Memory*, the former serving for immediate conscious perception, the latter containing the traces of past perceptions that could be revived by the activity of a centre of perception due to a new stimulation, which being in consciousness together with the latter, the subject is able to compare the new and the old in age and thus *recognize* objects.

18. Nowadays it is known that reflexes are not absolutely invariable processes or rigid mechanisms. The theory of "localization," that distinct mental "faculties" or modes of operation resided in definitely circumscribed areas of the brain, has been greatly modified. There is certainly some relation between cetrain brain regions and certain mental operations, but the notion of the storage of definite sense-images in definite cortical zones has been abandoned. Even an impaired brain has been found to adjust itself to altered conditions, and reflexes to be changed with the situation of the organism as a whole. The notions of the rigid reflex and localization do not fit in with facts recently gathered or with the latest ideas in neural physiology, and much less with modern psychologies. Only the Soviet school of psychologists persist in "explaining" mental facts by the physiology of the brain, and this because of the philosophy they adhere to. The explanation of complex human action on the scheme of reflexes is at best only an analogy; but the danger of analogy is that it often leads to identification.

What we can do is to localize functional disturbances psychologically but not anatomically ; *i.e.*, by analysing a complex mental process into several factors, we can point out which of these factors has been affected by a pathological disturbance, but we are not able to assign to such a disturbance a definite cortical area. The neurologists of the end of the last century failed to make a thorough analysis of the phenomenon of Recognition, and stuck to the assumption that material traces were left in localized cells. A make-shift explanation of the simplest mental phenomena may be given on physiological lines, but as soon as we get to a higher mental process the difficulties encountered become insurmountable. Physiology has indeed not been able to take the place of Psychology.

19. The Soviet School of Psychology, of which Pavlov was the most eminent, may be called the school of *reflexologists*. It is the one school which still claims to explain mental facts by the physiology of the brain. Their mechanistic psychology is not forced on them by facts ; indeed facts are chosen and many aspects of them ignored in order to fit in with their materialistic philosophy. They are determined to explain human behaviour on the basis of the reflex. Reflexes are the elements to which every human act is to be reduced. Pavlov investigated the *conditioned reflex*. We shall deal with the School of Reflexologists in a subsequent chapter.

CHAPTER V

SENSATION

1. The prominent features of sensation are *quality*, *intensity* and *duration*. There are different sorts of sensation due to the selectivity of the sense organs. They correspond to different forms in which

external energy is received and the organs react to them. Physical energies are no doubt interconvertible, and their intensities and properties are quantitative. Even in one sort of sensation, *e.g.*, sight, there are differences in quality, *e.g.*, in colour. Differences in colour have been associated physically with differences in wave-length (or in 'frequency') of the light-waves. Yet in sensation we do not experience them in this way. Photo-chemical action also differentiates between wave-lengths, *e.g.*, between red and violet. The conscious experience or psychical reaction is as a difference in *quality*; not because the light waves received are not connected with quantitative differences, but because the organism's reaction to them are different. No doubt, even in sensations of one sort, *e.g.*, sight or hearing or pressure, qualitative differences correspond to physically measurable quantitative differences. This does not signify that quantity is the same as quality. Quality is an aspect of a thing with reference particularly to its effect, direct or indirect on the perceiver, or the perceiver's reaction to it. With reference to the object, quality arises from the manner in which its energies are put together in a plan, quantity from the material, *i.e.*, the energies planned. They are doubtlessly interconnected.

2. By *intensity* in sensation is meant its vividness, its greater or less strength in consciousness. This is no doubt also connected with differences of physical intensity, ("power", rate of work done), in stimulus. But there are other factors, *e.g.*, attention, that come in. The *duration* of a sensation is the length of time during which a sensation persists in consciousness. It depends mainly on the continuance of the stimulus; but it is not always equal to or simultaneous with the duration of the stimulus. There are mechanical, electrical and chemical reactions in the organ and in the nerve cells and in the brain, and they all take time. Even the return action, *i.e.*, impulses in and from the brain to the muscle, take

time. In a reflex action consciousness may occur after the whole physiological event is over. This is by physiological memory, *i.e.* by the repetition of the image or physiological process. Some interval passes between the stimulus and the sensation, and the latter keeps on for a time after the stimulus, until a re-adjustment is made. Two excitations following in succession are recognised as distinct only if there is a minimum interval between them. If the interval between two sight impressions is about a fifteenth of a second, the sensation is continuous. Some photo-chemical action takes place in the retina, and if a second impression comes before the re-adjustment is completed, no distinction between the two impressions is made. This is the principle used in moving pictures. Sound impressions occurring in succession at intervals of less than a fifteenth of a second are also sensed as continuous. The recuperative power of taste and smell, after each sensation, is very much lower than that of sight.

3. Every external impression is considered to be impressed in the form of waves. Each organ is adapted to receive waves of energy of special forms and between certain limits of wave-length. The eye reports the reception of light waves within the visible spectrum, the infra-red and the ultra-violet being out of its range. So also is hearing limited to sound waves within a fixed range of frequency or of wave-length. In consciousness the whole scheme of wave-series is apprehended, not each single wave. The most wonderful thing is that although sensation is a unified operation, by *Attention* waves of one frequency can be attended to separately. Thus I can distinguish each musical note separately in a chord. Again, distinctions can be made of *timbre*, or *emotional tone*, so that I can follow out any one instrument in an orchestra independently of the others.

4. In the case of touch, there is also a minimum interval of *space* required in order that the stimuli

simultaneously applied may be recognised as distinct. This varies in different portions of the body. The contact must be *sufficient* for sensation; *i.e.* it must be spread over a definite minimum area, be of a definite minimum intensity and persist for a definite minimum time. Apart from the quantitative or measurable aspects of sensation, its characteristic aspect is cognitive. Sensation is an elementary mode of cognition. As such, it is not resoluble into elements, in spite of the fact that the *events* reported by it are physically sub-divisible into simpler events. If it were to be so resolved, there would be no end to it; the sensation of violet would reduce to several hundred billion elements per second, corresponding to the vibrations of the light waves. Sensation is ths subject's experience of his total physiological reaction. Some subjective aspect of it may assume greater emphasis than others.

5. The experience may be referred to the subject more than to the object or *vice-versa*. When subjective and objective import are thus distinguished, then *Sensation* may be considered as opposed to *Perception*. Sensation would then be the experience as reporting the subject's reaction to something external, and Perception the experience as reporting the nature of the object. For perception to get more and more objective, the reports of the same sense in other circumstances, the reports of the subject's other senses, and also the reports of other persons, must all be co-ordinated. In sensation, however, there is some perception, though vague. This follows from the fact that the subject is not the only factor in it, and also that there is always some co-ordination with previous reports. If there were no co-ordination there would be mental perturbation, fear. The Risen Christ asked the doubting Thomas to use his sense of touch also; and he ate with his disciples. Thus with sight, hearing and touch, not only of one individual but of many, perception was established.

6. *Pleasure* and *pain* are special subjective aspects of sensation. When there is healthy functioning pleasure is associated with it. When there is misfunctioning, due to disordination or an abnormal strain of some part, there is pain. A physiological movement may give pleasure, but when its intensity is increased beyond a certain measure it gives rise to pain.

7. A sensation, viewed as a physiological modification of the subject, is called a *sense-image*. The scholastics called it a *species sensibilis*, Democritus and Epicurus taught that objects threw out subtle representative images which were impressed on the soul. Aristotle thought that objects modified the mind by causing movements in the intervening media. (We are reminded of the particle theory and the wave theory of light.) The term *species* (image), was later used to denote the modification of the Mind by which it apprehends the external object causing the modification. We shall not, however, use this language, as it would suggest that the mind were itself a distinct modifiable entity. Mind is an abstraction, referring rather to an aspect of human behaviour. When speaking of detached spirits we may identify them with minds. But we know nothing of how such minds work. In man the 'modification' is a physiological one—the image—which bears a psychical character. The *sense image* is not *that which* is known, but *that by which* and *in which* a thing is known. It is the physiological process abstracted from its psychical character. When not so abstracted, it may be called a *mental image* or *species intentionalis*, to emphasize the point that the species is not the object itself, but is only representative of the object inasmuch as it is the plan of the process of the psycho-physical reaction to it. To show its origin however, the term "sense image" or *species sensibilis* is used; sometimes also the term *species impressa* or impressed image. The *mental image* is the conscious experience. There may be stimuli on the retina of the

eye, but if there is no attention, they do not result in sensation.

8. Man has a wonderful capacity *to abstract*. He can *pay attention* to one part or one aspect independently of the rest. He can also *Reason*, *i.e.*, know *relations*, taking each part or aspect in reference to the others and seeing them all as forming a plan In this connection we can only use metaphors or give illustrations, for Knowledge cannot be defined, nor can it be understood in physiological terms only. Its ultimate material is sense-images. It is directed consciousness. It may be said to be the psychical aspect of the whole process. In *Active Memory* the physiological processes or sense images are revived according to plan.

9. Various forms of sensibility have been recognized. If we classify sensations according to the specialization of the organ or the nature of the stimulus or to the quality of the consciousness, we arrive at the old scheme of *five* senses, *taste*, *smell*, *hearing*, *sight* and *touch*, the last named itself representing a group of sensations differing very much in quality: sensation of heat and cold, of muscular resistance, of pressure, etc.

10. *Taste*. The organ of taste is the surface of the tongue and palate, over which are distributed gustatory *papillae*, from which afferent nerves go to the brain. The body tasted is in solution in the mouth. The action on the papillae is probably electrochemical. There is no definite agreement in the classification of tastes. Sweetness is associated, up to a limit, with pleasure, and bitterness with pain. Taste is co-ordinated with smell and also with touch. Its cognitive value is low. Continuous stimulation deadens its sensibility; its recuperative power it tardy; it is modified easily by a previous taste; it varies with the state of health; it is wanting in precision, and it can be but very vaguely revived in imagination. It is

very subjective in character and when taken apart from the other sensations, gives very little knowledge of the external world. Nevertheless, in its emotional aspect this sensation arouses intense pleasure or pain, which, however, is short-lived. It is a guide in the selection of food to the animal world. When isolated from the sensations of touch and smell, sensations of taste have been analysed and reduced to blends of but four: sweet, sour, bitter and salty. And the sensations of taste itself blend with those of odour and of touch.

11. *Smell.* The organ of smell is the cutaneous membrane lining the inner surface of the nose. The gaseous or volatile substance passing in a stream over it is dissolved in the secretion which keeps the membrane damp. Probably also by electro-chemical action impulses are set up which are transmitted by the afferent nerves to the brain. The cognitive value of this sense is low like that of taste, as it has similar defects. It is closely associated with taste, and many adjectives describe both equally, *e.g.*, sweet, bitter, pungent. Sometimes one doubts whether a sensation is a taste or a smell; such are called *flavours*, and no doubt involve both, for the solution on the membrane may easily touch the taste apparatus, or the solution in the mouth (or some vapour from it), may find its way to the smell apparatus. Owing to this a fine susceptibility to taste or smell may be developed, as by connoisseurs and experts. Smell also arouses strong emotions, pleasurable or painful. It may be reckoned as of slightly higher cognitive value than taste. It is more easily revived in imagination. By it we become aware of objects at a distance, so that the sensation can be a premonitory sign of other future experiences. In many animals, *e.g.*, dogs, this sense is very much more highly developed than in man, and has a greater cognitive and emotional value. Sensations of smell have recently been subjected to analysis by H. Henning (1924) and reduced to blends of a small number of elementary odours.

12. *Touch.* This may be taken as the general name for several classes of sensations: organic sensations, temperature sensations, pressure sensations, and muscular or resistance sensations.

13. *Organic sensations* report not on the properties of the outside world but on the state of the organism irrespective of a causative source. There are sensations of hunger, thirst, repletion; of respiration and circulation, of irritation and laceration and of other states and movements. These organic sensations are in general vague, they can be but very feebly reproduced in imagination, imperfectly localized, and give little information of the outside world. However, in their emotional aspect they influence very greatly the tenor of our lives, and are indicative of the state of our health.

14. *Sense of temperature.* The organs of this sense are seated on the outer surfaces or periphery of the body, being distributed in different densities in different portions of the skin. Consciousness of hotness or coldness is relative to that part of the body involved in the sensation. This, however, soon becomes habituated to the temperature, if not too severe, and then the consciousness disappears. The sensitivity is increased with an increase of surface exposed. The hand can detect a difference of a quarter of a degree Centigrade in two vessels of water. In extreme heat or cold, there is no sensation of temperature but of organic pain. This sense has little cognitive value, but much emotional import. It has been found that on the skin there are certain little spots sensitive to warmth, and others sensitive to cold.

15. *Sense of contact or touch or pressure.* The organ of this sense is a system of *papillæ*, scattered over the surface of the *dermis* or under-skin which is below the protecting cuticle or outer-skin. From them afferent nerve-fibres proceed to the spinal cord

and the brain. The stimulus is touch or external pressure. The sensation is referred to the seat of pressure. This reference becomes a physiological and consequently a mental *habit*, as we have said elsewhere. The sense of contact or touch is of great cognitive value, though the information is only of things in physical contact with the subject. In some parts of the body the localization of the stimulus is less precise than in others. The papillæ are distributed in different densities in different parts of the body. There is little variety in this sensation. Bodies are differently described as rough, smooth, blunt, sharp, hard or soft, sticky, grainy, etc. The tactual sensations are susceptible, however, to great fineness in detecting differences in intensity and duration, and some parts of the skin are very sensitive in localisation, *e.g.*, the tips of the fingers. Two points, a small fraction of an inch apart, can be recognised as distinct by a finger-tip, whereas on the back of the body they have to be some inches apart. By this sensation objects appear to us as extended or occupying space. Tickling and itching are special modes of this sensation. Sensations of touch cannot be vividly reproduced in imagination; however, they can be recalled by a present similar sensation, and even by associated sensations of sight; by looking at an object we may say whether it is rough or smooth, or hard or soft. Touch, taken by itself alone, has a low emotive value. It is, however, through this sense that pain is inflicted. It is also the occasion of sexual excitation. Sensations of muscular movement and of muscular effort or resistance are called *muscular sensations*. The association of touch with the *muscular sense* gives it a high cognitive value.

16. In every sensation, it will be noted, there is a disturbance of organic equilibrium and a reaction by which the organism tends to rehabilitate or readjust itself. Consciousness is an aspect of this reaction—loosely speaking, it "accompanies" the reaction.

The reaction of the organism starts at once with the reception of the external impulse by resistance to it firstly and then by re-adjustment of physiological equilibrium. The re-adjustment persists necessarily after the external impulse is removed. It is the whole reaction of the organism which consciousness seems to accompany. In it we must include the physiological tendency to repetition which is of an oscillatory nature and keeps up the reaction. Just as there is an *after-image* in sight-sensation, there is also one in hearing, and probably also in all the other sensations.

17. Muscular sense may be trained to a high degree of sensibility. It also gives an experience of *time*. For, as we saw, the products of chemical action in muscular effort are a measure of the effort. This experience of time is, however, very largely subjective and variable. Muscular sensations cannot be vividly reproduced in imagination, but the relative amounts of effort in two acts of a habitual nature, *e.g.*, walking, can be finely estimated. Muscular sensations of the eye muscles, neck, body and limbs, when associated with sensations of sight and hearing, make us acquainted with distance and direction and also vaguely with speed. By *movement* the experiences of the other senses are varied, and we come to know not only the external world but also ourselves.

18. Muscular experience affords keen enjoyment—the "*pleasure of right functioning*." Its pain is *fatigue*. There are also organic pains, of laceration or disease or tensions due to non-co-ordination or molecular displacements in the muscle-cells arising from overstrain.

19. *Hearing*. The organs of hearing and of posture have been described already, as also their mode of functioning. Sounds are described as *musical* or *unmusical* or as *articulate and inarticulate*. Noises

are inarticulate unmusical sounds. It is the regularity of vibrations that make a note or musical sound. The chief properties of a musical note are intensity, duration, pitch and timbre. Piteh is related to the frequency or rate of vibration ; the higher the frequency the higher the pitch. Timbre or musical quality is the peculiar feature by which the sound of a note produced by one instrument (or voice) differs from that of the same note by another instrument or voice. Differences are due to the overtones present as well as to the irregular vibrations also produced, *i.e.*, to "purity." Notes whose pitches or frequencies are related according to known laws blend together with an agreeable effect called ***harmony***, producing a ***chord***. When they do not blend there is a ***dischord ;*** and a dischord by itself gives a disagreeable sensation. A succession of notes giving an agreeable effect is ***melody***. In melody rhythm plays a great part. A piece of music may be a chordal structure, *i.e.* with chords occurring in it. When a succession of notes of the same timbre form a melody in a chordal structure it is a ***symphony***. In it intervening dischords give freshness and variety and so have a pleasing effect, provided, however, they are properly "resolved." To investigate auditory sensation, investigators have firstly to be able to control the stimuli. This they do by the aid of their knowledge of physics. Conditions have to be rendered as favourable as possible for easy and accurate observation. A set of reliable observers then report their impressions under the application of the controlled stimuli. Melody is a planned structure and only when taken as a whole is the plan perceived. The elements of sensation are not altogether in the organism. The melody is in the plan of the series, and it is due to the physiological tendency to repetition that the plan is perceived.

20. The Limits of Audibility lie between 30 and 30,000 vibrations to the second. The experience of

loudness corresponds to the physical quality of intensity. Intensity is measurable to a great degree of accuracy, and loudness also in a rough manner. The loudness varies as the logarithm of the intensity. (Weber-Fechner Law.) Great intensity is displeasing and gives pain. Many wild animals have a more highly developed sense of hearing than man.

21. Though the sense of hearing is not of great direct value in objective cognition, it is of utmost importance on account of Speech. It is endowed with great sensibility in the discrimination of intensity, duration, pitch and timbre and other qualities of the vibrations imparted to air. Sounds are reproducible in Imagination and Memory, and are readily associable with other sensations. Hence they are peculiarly suited to serve as *symbols* and the basis of Speech. The association with sound-symbols, however, may finally be transferred directly to written symbols. The sense of hearing acquaints us also with direction and distance, when, with it, are associated the sense of posture and the sense of muscular exertion.

22. Sounds may have great emotional value. This is especially true of music and of speech. Various sorts of emotions may be aroused by association. Since it is by sounds chiefly that animals express pleasure as well as pain, this is to be expected. The variety of sound and the modulations that the voice can produce, and that can be produced by instruments, adds to emotional expressiveness. And consequently to the power of music and speech to awaken emotional responses. Music and Speech illustrate perfectly the *planning* which man is capable of, the endowing of sounds with significance and the perception of such significances.

23. *Sight.* The organ of vision is a delicate complicated structure. It is described in most elementary books of physiology. Light rays entering between

the lids pass through the *cornea* and then through an aperture and through the *crystalline lens*, by which they are focussed on the *retina*. This is a transparent net-work of fibres and nerve cells, connected with an outer covering, the *choroid*, by a layer of rods and cones. These are most densely packed in the centre of the retina at the *yellow spot*. Slightly to one side of the yellow spot is the terminal of the afferent optic nerve, the *blind spot*. Three kinds of humours are in the eye, of different refractive indices. Some photo-electric action takes place on the retina, varying according to light and shade and colour and intensity of parts of the focussed image, and the impulses are conveyed to the brain, giving the sensation of sight. The sense of sight is very delicate and capable of fine discrimination. The Limits of Frequency of light rays to which the sense is susceptible are from about 460 billions per second to about 670 billions per second. Eye muscles are able to control the size of the aperture letting in the light as well as the shape of the lens focussing it on the retina. There are external muscles also controlling the movements of the lids.

24. A colour sensation must be accepted as a unit experience, not analysable into elements; although physically white light is composed of rays of various lengths or frequencies, and although we may pay attention to one aspect or to one portion of the image received. However, since the external stimulus can itself be analysed, it has been found convenient to assume that a colour sensation may be reduced to a blend of six elementary sensations, white, black, red, yellow, green, and blue. Colour-blindness is not a rare phenomenon. A colour-blind person can only discriminate between light and shade, colours appearing as different shades of grey. Some are colour-blind only within a small range of wave-lengths. If you gaze at a coloured object for about thirty seconds and then suddenly turn your eyes on to a grey background, you will continue to have an image in outline, not

with the original colours in it but with the complementary colours. This is the *After-image.* This corresponds to a re-adjustment persisting for a short time. It has been suggested that the nerve fibres distributed on the retina are of different kinds adapted to different ranges of frequency. In any case the unity of the sensation is indisputable. *Depth* is the aspect of the sensation corresponding to physical intensity ; *tone* the aspect corresponding to wave-length.

25. We may mention in this connection recent experiments of making a blind person "see" by a series of electric shocks or mechanical stimuli applied to the optic nerve or optical centres, by which the person may distinguish colours and perhaps forms. Thus also we sometimes "see stars". Perhaps in the future on apparatus may be devised to help the blind to see.

26. The sense of sight is capable of fine discriminative power, and sensations can be recalled vividly in Memory and Imagination. This sense, however, cannot recognize two sensations as distinct if one follows the other very rapidly, say in less than a fifth of a second. Hence in respect of duration of stimulus it is less discriminatory than hearing. The sense of sight gives experience of direction, distance, and extension, not only on account of muscular sensations in the eye-apparatus due to focussing and the convergence of the lines of sight of the two eyes, and of other muscular movements of the head and neck, but also and especially on account of co-ordination with other experiences. Two points 0.004 mm apart can be recognised as distinct at the normal distance for reading, when their images, (physical), lie very close to the yellow spot. This sense is the most relied upon for scientific exactness and objectivity. Owing to the associability of sight images (physiological) with the images of other sensations, and the co-ordination of the sense with the other senses, it has great cognitive

value. The direct emotional value of sight is not high; but because dissociations and associations can be easily effected, the emotive value of sight is very great.

27. As a direct source of pleasure or pain sight ranks very low among the senses. Organic pain may be aroused by fatigue or strain, also by great intensity. Colours and harmonious arrangements of colours are pleasing; while darkness and glaring contrasts are disagreeable. Natural scenery and visual art, *e.g.*, painting and sculpture, give pleasure, but rather of an intellectual kind connected with planning and relations perceived, than as immediately accompanying the sensations.

28. It will be seen that if the senses be arranged in regard to direct emotional value, or as *immediate* or *direct* sources of pleasure and pain, the organic senses rank the highest and sight the lowest; whereas if they be arranged in respect of their mediate cognitive value the reverse order holds.

29. Can the blind man who reads Brail with his finger-tips 'see'? In a sense he can; and that is the sense in which all the sensations are but modes of cognition. That is why the word 'see' also takes on an extended meaning.

30. That there is a *relativity* in sensation has been known from the earliest times. The quality and intensity of a sensation depends not only on the nature of the stimulus, but also on that of the proceeding and accompanying sensations. In general, *contrast* increases the strength of the succeeding sensation, or exaggerates the difference when two sensations are simultaneous. This fact does not, however, justify the view that *all* consciousness is merely a feeling of difference or change. Thus Hobbes said: "to be always sensible of one and the same thing is the same as not to feel at all." Change is certainly essential as a

stimulus. Sensation is not primarily comparative. Contrast in two successive sensations is due to the persistence of the image of the first. We sometimes experience a stimulus *lasting a long time*, *e.g.*, a musical note, until it is crowded out by another experience. The factors of fatigue after the first sensation, or of adjustment or setting of the organism to that experience, or of the restoration of electro-chemical equilibrium, must be taken into account; in the second sensation fresh neural elements may be employed in place of those rendered less sensitive by products of electro-chemical action. Moreover, continuous uniform sensation would require continuous *Attention* and *Interest*; but these may be withdrawn to other sensations or be aroused anew by contrast.

31. In order of temporal succession we have reception of the external energy; physiological modification of the organism to the continued reception, and the reaction that starts at once and persists for a time after the reception has stopped; consciousness of sensation; perception of an unit; recognition or perception of the external object. For perception is needed the consciousness of the whole reaction as a plan. For recognition or perception of the external object are required mental images and associations and the apprehension of significance of the whole.

32. If there is not a sufficiency of contact in any of the modes of sensation, there will be no sensation. This is a noteworthly point in regard to casu efficiency.

CHAPTER VI

PLEASURE AND PAIN

1. The term *feeling* is used in a variety of senses. It is used for the external and internal sensations or senses, or sensibilities, and sometimes only for those of *touch;* it is used as equivalent to *emotion*, *passion*, *affection*, *tenderness*, *sentiment*, and the like, it is used also to express the pleasurable or painful *aspect* of a psychical movement, or to stand for mental excitement in general; and it is sometimes taken as a *belief*, the grounds of which are obscure or non-rational—a "hunch". We shall employ the term in spite of this, but we shall give it a limited application, though, we confess, we are unable to define it. Feeling may be described as a special subjective aspect of consciousness, of the manner in which the subject is consciously affected in his self by an experience, the *tone* of his mental activity. It is that subjective aspect of a sensation, internal or external, which may be described as agreeable or disagreeable to the Self. When the aspect is agreeable, the feeling is *Pleasure;* when disagreeable, it is *Pain.*

2. Pain is not merely the negation of Pleasure, nor is Pleasure merely the negation of Pain. Pleasure and Pain may both be positive and immediate. Feeling may be considered abstractly from sensation proper, which is itself a reaction to a change effected in the subject. Feeling is also a stimulus to movement, and it also accompanies the sensations involved in movement or physical change.

3. We have spoken of Appetite as the inception, in accordance with a tendency, of a movement, subjectively experienced as an Urge towards some sort of unification. There is also a tendency which is subjectively experienced as an urge away from something

or some condition. It is also towards a unification—the strengthening of an inner organic union. It is directly experienced as an urge away from "contact" with something, a contact experienced as disturbing to the union.

4. If "Appetite" be taken to cover both the urges, the term "Desire" may be taken to signify the urge *towards*, and the term "*Aversion*" the urge *away from*. Appetite then is relative to something external. In a sexual movement the tendency is to a union by contact with another. The internal sexual movements are experienced as internal sensations of which pleasure is the dominant note. Pleasure stimulates the Desire. It may not be absolutely said that Desire is *initiated* by pleasure. It seems to us that where a movement has not been experienced previously, neither could the pleasure attached to the sensations involved have been experienced before, and that therefore Desire normally, (except in cases of anticipated pleasure), precedes pleasure. The movement is initiated by the internal conditions prevailing, (not only purely physiological but also psychical). It is for this reason that we can look upon certain tendencies in vegetative life as "appetites"; though there is no question of consciousness of them, much less of Pleasure or Pain, in plants. In sensitive life, it seems to us, pleasure is concomitant with the sensations of the movement resolving an urge, rather than with the urge itself or its satisfaction.

5. *While Desire is directed towards some contact* and is aroused by a normal activity of the organism, aversion is directed away from contact and is aroused and maintained not by a normal spontaneous activity, but by an abnormal activity or a disordination of the functioning of the organism. It is fitting, therefore, that pleasure should accompany the resolution of desire, though not necessarily initiating the movement, whereas pain should itself arouse aversion and

initiate the movement resolving it, this being a natural reaction to the painful sensation. *Pain is not concomitant to the movement resolving the aversion; if there be feeling, it is rather of pleasurable relief; whereas pleasure accompanies the movement itself resolving desire.* Pleasure shows a perfection in the reactivity of the organism, and pain imperfection. Appetite is directed to vital perfection. Desire is directed to a contact not actual, whereas Aversion is directed away from an actual contact.

6. The pleasure of relief from pain is not the transition itself but rests in the sensation of adjustment and return to healthy functioning.

7. What we have just said does not hold in cases where pleasure or pain is in consciousness by imagination, when either may arouse the appetite and set it going.

8. In the satisfaction of hunger and thirst pleasure accompanies the process, and is not the 'result' of satisfaction—except perhaps by recollection. Pleasure is the positive concomitant of the free and healthy exercise of vital functioning; it is not the transition or passage from a state of pain. Many pleasures are without antecedent pain, *e.g.*, those of smell, sound, sight, even of taste, and those of recollection. Nor is pain the mere want of pleasure or its transition. It is also a positive note of conscious experience. The intensity and duration of feeling is dependent partly upon that of the sensation proper, which itself depends both on the physiological mechanism as well as on the nature of the stimulus, in addition to Attention, more particularly to the feeling-aspect of the sensation; moreover, it is augmented by concomitant intellectual adjuncts.

9. Since feeling goes with sensation, its intensity cannot increase without measure nor can it remain

constant with a constant intensity of physical stimulus. The neural mechanism works in an oscillatory manner and is subject to wear and tear and repair. Sensation may be stimulated up to a limit and then decline. When the rate of the repair becomes less than that of the wear, then the limit has been reached and "pleasure begins to cloy," and the sensation may even become positively painful. Pain may result from excess in intensity or duration of a sensation which ordinarily is pleasurable.

10. Just as there are different kinds or "species" of sensation, so also are there different sorts of concomitant pleasure or pain, and varieties of each kind of sensation correspond to varieties in feeling. There is a "conflict of feelings" when each, as it were, makes a claim to exclusive attention. Very often they are attended to in rapid succession, and sometimes one gains prominence over the others.

11. We shall now summarise the above in a few statements:—

(1) Pleasure accompanies the sensation of spontaneous normal reactivity of the organism to healthy contacts as well as the sensations of normal healthy functioning; pain accompanies the sensations of normal reactivity to unhealthy contacts or of abnormal or unhealthy reactivity or of normal reactivity either unduly restricted or carried on in excess, or of an urge being restricted or thwarted.

(2) Pleasure accompanies the sensations involved in the resolution of a Desire. When antecedent to Desire by anticipation or by a sensation experiened, it awakens and stimulates Desire. Thus a pleasant taste may create an appetite. Pain awakens aversion and initiates the resolution of an Aversion, the pain itself being the accompaniment of sensation. Pain also results from the thwarting of a Desire.

(3) The law of intensity and duration of feeling follows that of the intensity and duration of sensation; but as we can "abstract" feeling from the other aspects of sensation, attention to the feeling alone has to be taken into account, as also association and dissociation.

(4) In the resolution of a Desire pleasure may increase with sensation up to a limit, and then rapidly decrease and even be succeeded by pain, according to the laws of wear and tear and repair.

(5) Pain never accompanies the resolution of an aversion *as such.* If it does, this is due to organic misfunctioning or strain in the resolving process, accidental to the occasion. There is a limit also to excessive pain, when unconsciousness supervenes.

(6) Pain, however, accompanies the thwarting of an urge or the restriction of the resolution of a desire. It increases with the effort expended up to a maximum, beyond which there may be mental derangement.

12. One becomes accustomed to things. In course of time one gets used to an odour that was at first agreeable or disagreeable, and fails to notice it; so also with the taste of food. This is because the organism accommodates itself to the stimulus. If this is too severe a prolonged permanent damage may be done. Healthy functioning must be more than habitual in order that one may be conscious of pleasure in it, *e.g.*, walking, physical exercise.

13. There is some degree of relativity in pleasure. The pleasurable quality of an activity is increased by contrast with that of a previous activity. The pleasure of healthy functioning is augmented by a period of rest. Change is agreeable; "variety is the spice of life." This law also has an organic basis. Moreover, a new sensation has more chance to catch the attention than an old one has to retain it.

14. While it is true that continued or repeated experience tends to diminish the accompanying pleasure or pain, it is true also that owing to "accommodation" there is a shift in normal activity and reactivity, so that pleasure is generated in the sensations of the mode of activity as now become normal and pain in the sensations deviating from this normal. Thus the reiteration of an action originally disagreeable results in a habitual tendency which may become a craving.

15. Pleasure and pain are of the whole body. Although in a sensation these feelings, especially pain, are referred to a particular organ or area of the organism, yet even as referred it permeates the whole conscious organism. This is so especially in the case of pleasure of healthy functioning, the pleasure not being referred to particular muscles or organs, even though sensations may be referred thereto.

16. Pleasure and pain are great factors in the conservation and progress of life, both of the individual and of the species. They are directive of vital movements—pleasure towards unification in harmony with the well-being and development of the organism, pain away from what is injurious or restrictive of development.

17. The object of desire may be a material object, appropriate vital contact with which arouses pleasurable sensation. The object of aversion may be a material object, contact with which arouses painful sensation. But the object of feeling may be energy in other forms. We may say in general that desire is directed to the absorption of energy into the harmony of the organism, the sensation of which absorption is pleasurable. Even in the urge to healthy activity and the pleasure of healthy functioning this is true. Aversion is directed to the expulsion of energy that cannot be absorbed into or that has fallen out of the harmony of the organism.

18. It is not justifiable to speak of a 'faculty' of feeling: firstly, on account of the general objection to the notion of a faculty; nextly, because there is no organic part or mechanism of the organism whose function is feeling, as there is for each sort of sensation; again, because pleasure and pain are not special kinds of activity; nor can pleasure and pain be conceived as 'powers' pent up or potentially within the organism and just waiting to work themselves out. They are merely aspects of psychological activity. Even the followers of Aristotle did not assume another 'faculty' for either pleasure or pain or for both.

19. To deal in detail with other complex phenomena which also come under the heading 'feeling' will require a volume by itself. They are complex aspects of conscious experience in which besides pleasure and pain other notes are to be discerned, superadded qualities by which pleasure or pain is modified.

20. In what we have said so far we have only considered the basic feelings, pleasure and pain, and these only from the point of view of sense cognition, and the basic appetites, desire and aversion, as organic urges. In man, however, cognition may be of higher types. Cognition itself is a unification; there can be a psychical dynamic unity just as there is an organic one. So also are there tendencies to unification and urges to or from. In connection with psychical urges we may speak of ideas, just as we spoke above of energies that the organism sought to absorb or reject. The process of psychical absorption of a perception or an idea into the unity of the mental content gives pleasure (intellectual), the resistance to absorption, the disturbance to the mental unity, gives pain or perturbation. Intellectual pleasure, therefore, is to be taken as that subjective aspect of a cognitive process which may be described as agreeable; *Intellectual urge* as the tendency towards a psychical union. (The term 'appetite' may be restricted to urges in the sensitive organic

plane). A desire is an urge towards an idea to be absorbed into the mental content. An aversion is an urge to keep out or discard an idea from the mental content. Just as appetites are directed objectively to the well-being and development of the organism in the sensient plane, so intellectual urges are directed objectively to the well-being and development of the intelligent being, particularly in the intellectual plane with special supra-sense aspects super-imposed.

21. The feelings whose basic qualities are pleasure and pain, therefore, have super-imposed on these other aspects. Thus they are complex.

22. The first feeling we should mention is Familiarity. It is a pleasurable feeling of acquaintanceship, a complex of pleasure and recognition. In it is involved the pleasure of functioning, acquired in some degree of facility by previous experiences. In it is also involved unification by memory. Its cognate is Unfamiliarity or Strangeness, a complex of pain and of failure in recognition; there is an obstruction to the effort of unification by memory.

23. When there is cognition of danger or liability to a painful experience—however this might arise, whether by experience or reasoning or as an hereditary accompaniment to certain sorts of strangeness—the painful feeling is Insecurity. When the intensity is great and is referred to a future experience, it is called Fear. The cognate pleasurable feeling is Security, when the feeling is referred to a future experience it is Confidence or Courage.

24. The suddenness or unexpectedness of a cognition may cause Surprise, which may be painful or pleasurable according to the sensations involved or the nature of the cognition. Too great a surprise is painful. In general suddenness begets fear. Surprise is obviously allied to strangeness.

25. When there is doubt about the danger aspect there is Anxiety, an oscillatory feeling of security and insecurity in which the latter predominates. Anxiety is particularly connected with cognition that refers to the future. The danger contemplated may also refer to another person, but ultimately the reference is to the self.

26. The feelings of Certainty and Uncertainty do not refer to danger or to the object of cognition but rather to the nature of the cognitive experience. Uncertainty or doubt may arise from the insufficiency either of the cognition or of the mental content, on account of which the mental process or experience harmonises with the mental content only partly and is partly disturbing. When the experience is wholly disturbing, there is Perturbation in the sensitive plane or Perplexity in the intellectual plane. Perturbation and perplexity together make up Bewilderment.

27. The painful feeling strengthening an aversion is Disgust. A strong feeling of pleasure is Delight. These feelings depend on the nature of the object perceived as able to arouse feelings in the cognitive self. They do not usually refer to immediate cognition.

28. An object may be desired on account of the subsequent pleasure to be derived from it, or detested on account of the subsequent pain. Desire and aversion may be instinctive urges; but when their direction to a particular object is by anticipated pleasure or pain, an intellectual aspect is given to the movement.

29. Gratification ("pleasure") is the pleasure that arises anew with the contemplation of pleasure previously experienced; Hurt is the pain that arises with the contemplation of pain previously experienced. They are the pleasure or pain revived by memory.

30. Altruism is the urge to bring about the pleasure

of another as of oneself, or the urge to a union by extending the self so as to include another self in regard to pleasure. Sympathy is a mode of union with another person or an attitude towards another, such that pleasure is aroused with the knowledge of his pleasure and pain with the knowledge of his pain. It is a mode of moral union of minds. Kindliness or tenderness or affection is a feeling which initiates the altruistic urge. It may be called the altruistic feeling or friendliness. Cruelty is its opposite, the feeling initiating the urge to bring pain to another. It is possible, because the experienced contact or mode of union with the other may itself be conceived as bringing pain to the self; the urge being primarily to break up the wider union and thus preserve the union within the self. The pleasure has a negative source in cognition: that the pain is felt not by the self but by the other self, and pleasure rises up, as it were, in the self by contrast. It may be aroused also by excess of sexual sensations, and then it is called sadistic. It is a mixed feeling of pleasure and pain.

31. There is an urge to a cognitive functioning with an intellectual aspect. This is Interest. It is allied to Curiosity, which is an urge to greater cognition of or acquaintanceship with an object, a mode of union. Curiosity becomes interest when the cognition sought for takes on an intellectual aspect. The pleasurable feeling accompanying the mental processes involved is also called Interest. This corresponds to the pleasure of right functioning in the lower plane.

32. The pleasurable feeling of harmonious functioning with respect to the external world is Contentment or Satisfaction or quiescence; when the external world is taken more particularly as human society the feeling goes by the name of Peace. The opposite feeling is Discontent, Uneasiness or Worry. There is also a pleasure accompanying the knowledge of achievement, and a pain accompanying the knowledge of failure.

Thus we have the Pleasure of achievement, or Triumph or Elation, and the Pleasure of understanding; the pain of failure and the pain of perplexity. Then there is the pleasure of power or of knowledge of ability to achieve, and the pain of impotence. We may also mention the pleasurable feeling of fitness and the painful feeling of fatigue; also boredom, which is more intellectual in aspect. Anger is the painful feeling accompanying the consciousness of resistance. It may initiate not only aversion but also desire to bring harm to another, and so is allied to cruelty. When the feeling is habitual in respect to an object, it is called hate.

33. A high degree of interest with a modicum of perplexity is the feeling of wonder. The pleasure of understanding some external phenomenon and of seeing its harmony may be called respect or admiration. The phenomenon may be another person's qualities or achievements. When they are of the self in contemplation, it is self-respect. Self-respect becomes pride when there is an irrational exaggerated estimate of one's own qualities or achievements. When these qualities or achievements are contrasted with those of others as superior to them, there is the superiority feeling. When pride goes along with the knowledge (or supposition) of the admiration of others, it is vanity; which also arouses the urge to "show-off."

34. The opposite of admiration is contempt; the opposite of pride is the feeling of humiliation; that of the superiority feeling is the inferiority feeling; that of vanity is humility.

35. Together with the cognition of the desirable qualities or achievements of another may go the painful feelings of envy and jealousy. There is envy when a strong desire is aroused for the same in the self; jealousy when the desire is to deprive the other of them. In this sense jealousy may be considered the opposite

of the altruistic feeling. The term jealousy is also used when there is a fear of being deprived by another of certain qualities, even of desirable attitudes of others to the self.

36. Shame is the painful feeling of humiliation excited by consciousness of the exposure of some false situation or defect—physical, mental, moral or even social—of the self, such as would arouse contempt in others.

37. Guilt is the painful feeling accompanying the consciousness of a breach of some law observed and respected by society.

38. A strong pleasure is Joy. The term is used for the pleasure of immediate or mediate cognition, especially of the cognition of unification by acquisition. The opposite is Sorrow. Happiness is the state of continued joy, Misery that of continued sorrow. Grief is sorrow connected with the consciousness of great loss.

39. The acceptance of an abstract idea or of a situation as harmonising with the self is acquiescence or assent.

40. When confidence is based not directly on the understanding of a situation envisaged but on other considerations, it is belief or trust. The other considerations may be the qualities of a person or thing connected with the subject in a future situation, or they may be special circumstances also envisaged as arising. Faith is trust in the acceptance of a doctrine in the matter of future results from it. (The term is also used for trust or belief.)

41. Hope is the pleasurable feeling accompanying the outlook on the future as pleasurable and as likely. It may be considered as an opposite to fear, which is the painful feeling accompanying the outlook on the

future as painful and as likely. In courage, although the future is also envisaged as likely to bring pain, pleasure arises with the cognition of the avoidance or overcoming of the pain.

42. Love is the name of the altruistic feeling as well as of the altruistic urge, raised to the highest plane. The urge is to perfect union with a person, especially in mind and will, by which the self and the other self become, as it were, one self; pleasure and pain, experiences and movements common to both; the good of the other sought as if it were the good of the self; harm to the other avoided as if it were to the self; obstacles to the other as if they were obstacles to the self. To be on the highest plane it cannot but be based on the highest mode of cognition, and directed freely. The pleasure accompanying the resolution of the urge is love. This pleasure is felt even if obstacles stand in the way, and is strengthened by the overcoming of them. Love accompanies intellectual cognition and volitional effort.

43. Feelings have significance. Pleasure is the sign of well-being (at least partial), of fitness, of the harmony of functioning within the self and of the self with the surroundings. Pain is the sign of the opposite. It is noteworthy that pleasurable events have a greater tendency to remain in memory than painful ones. This is not to say that painful events always escape recollection; such a statement would be false. By its nature the recollection of pain is painful, while that of pleasure is pleasurable.

44. The conditions of pleasure and of pain are not the same. Nevertheless, there can be mixed feelings. Just as one sensation may be more in consciousness than others at any one time, so also one feeling may be more prominent than another.

45. Hedonistic ethics conceives of pleasure and

pain as directive of all human acts: man seeks for pleasure and the greatest possible amount of pleasure, and he avoids pain; these are the only positive and negative goals of action. Man pursues only egoistical aims; and even should an action be seemingly altruistic or self-sacrificing or leading to unpleasant and painful results, the aim is only the avoidance of pain and the attainment of pleasure. The pleasure sought for may be a future one to compensate amply for the present pain, or the pleasure of getting the approval of others; the pain to be avoided may be that of the sentiment of not having lofty ideas, or that of being despised or disapproved of by others.

46. That man does many things with no thought of pleasure in the immediate or distant future, is a statement based on experience. It is only a distorted vision and the consequent prejudiced interpretation of facts that would lead to a denial of it. If he is effectively moved by the idea of moral goodness to act in a moral manner, it is not because he desires to have the comfort of a good conscience or to avoid the unpleasantness of guilt or remorse. The provision of remorse is generally incapable of keeping us from pleasurable actions that we feel to be wrong. In some cases at least we foresee only unpleasant consequences and still persist in an action merely because we feel it to be right. Again, a sacrifice is made because it realises a value higher than that which is given up, and that value is not measured by any accompanying sensuous pleasure. Granted that more often than not moral actions are not dictated by a full understanding of the values realised by them, and that in a great majority of cases people are prompted by base motives; some instances must be acknowledged where this is not true. It is only in the most highly developed examples of human acts that the peculiar human traits are most evident. The highest characteristics of human life are not to be studied in the behaviour of the maimed and the demented. At sometime in a person's life he will

have the experience of feeling that he has to do this or that, no matter what the consequences may be. Moreover, there are cases where the results of an action are not foreseen as painful; withal they are done irrespective of any pleasure to be derived therefrom. True love does not seek for gain. A mother in general, nursing an infant, thinks also of the child, of its needs and well-being, not only of her physical feelings and sensations.

47. Value is not purely a subjective concept, the manner in which the subject views an object as desirable to the self or not, or the quality of the subject's experience of the object in its relation of arousing his pleasure. It is not the pleasure-giving capacity of the object. However much there may be the subjective element in value, there is also an objective element. Value, like truth, is reality in one of its aspects. Things have value inherent in them irrespective of an individual's reaction and of their own nature. We can have value to a large extent objective.

48. Value is intellectual, to be apprehended by a higher cognitive act. The value does not arise from the fact of giving pleasure or satisfaction. A value may be apprehended even prior to the fact. An individual's pleasure arises from objective value, is consequent on it; but the individual's reaction is not necessarily proportional to the objective value. It is only when subjective values approximate to objective ones that there can be an enduring peace of mind. In man's highest acts the aim is value.

49. To go back to the topic of pleasure, it is no modern discovery that man strives for pleasure, or rather happiness—a state of enduring pleasure. In a sense it is a truism remarked on by philosophers from the earliest times. Nor is 'pleasure' itself a term without ambiguity. Pleasure is of various kinds and degrees. The pleasure of a child when eating chocolate

is not of the same kind as that of a student who has solved a ticklish problem, and this latter is not the same as that of an author who sees his work at last in print, or that of a lover of music listening to a fine rendering of Beethoven. Moreover, it is very far from true to say that we can measure the total amounts of pleasure and pain envisaged for an action and consider the latter as directed by the "resultant" pleasure or pain envisaged.

50. There are several sorts of pleasure which differ from each other so much that they cannot be reduced to a common denominator. They differ in quality or tone, in their modes of development, and in the reactions that follow them. They differ also according to the nature of the cognitive experiences.

51. We have already said that feeling accompanies cognition as well as other conscious modes of union of the subject. Cognition is of two kinds, sensual and intellectual. Consequently, pleasure and pain may be reckoned as of two types, sensual and intellectual. The term "feeling" itself is usually restricted to sensual experience, but "pleasure" and "pain" refer to intellectual experiences as well. Buehler distinguished three kinds of pleasure: the Pleasure of Function, the Pleasure of Satisfaction and the Pleasure of Creation.

52. Properly speaking all pleasures of sensation come under the heading of pleasure of function, for they involve right functioning under appropriate conditions of specialized mechanisms in the unity of the organism. Even among these sensuous pleasures there are vast differences. No doubt one child may prefer a toy to sweets, and an adult some beautiful music to some other entertainment, but who can measure the pleasure of taste against that of sight or any other sensuous pleasure? The intensities of the sensations may be different; but even if these were measurable quantitatively, with what degree of certitude can one say

that such a part of the measured sensation-movement represents the pleasure in it? Who can calculate the "resultant" of all the pleasures and pains experienced? Again, the pleasure of function is not confined only to the sensuous plane. It certainly often has a higher aspect. There is also pleasure of intellectual functioning, a pleasure when acknowledged, held to be of a higher order. Such, e.g. is the pleasure of the scholar, of the inventor, of the discoverer.

53. The characteristic feature of the activity engendering this pleasure even in the lower plane, e.g. play, does not in general aim at any particular moment of satisfaction, but goes on giving rise to pleasure continuously. This is more true in the intellectual plane. Interruption or fatigue may put a stop to the activity, but the activity is given up with regret. How often does a person wish that his physical strength could last much longer, so that he may have greater enjoyment in his occupation! The activity engendering pleasure is its own goal. The same is true of the pleasure of taste. Eating and drinking, or hearing or seeing or smelling, do not aim primarily at satisfaction, though this may be a goal set up intellectually. That the accompanying pleasure decreases and finally stops and is even succeeded by pain, is a dispensation showing the wonderful order and economy of nature. After a meal the pain of hunger has been stopped by the normal working again of the stomach on appropriate contents; however, the pleasure has not been directly stopped by the satisfaction of the needs of the stomach, but by other attendant circumstances connected with the organs of taste, while in the case of over-indulgence it is eclipsed by a new sort of pain. After a satisfactory meal there is the pleasure of digestive functioning, but this is most vaguely in consciousness. The pleasure of taste only rises up in memory. In regard to the play-activity mentioned above, there may be a satisfaction aimed at, e.g. in games where there is the desire to win. In this

case also activity has an intellectual aspect superimposed on the primary instinct, and in it is involved the pleasure of achievement. In a competitive game the activity is enhanced and consequently the pleasure of functioning, which is not only physical but also intellectual.

54. For these reasons we do not accept Buehler's Pleasure of Satisfaction. He illustrates it by the satisfaction of hunger and thirst, which we have just discussed. However, in the moral plane there may be a pleasure of satisfaction, e.g. the pleasure of having done one's duty. It may be called a calm conscience. There is also a revival of pleasure when a past pleasurable experience is recalled to memory, and the feeling of contentment arising from the knowledge that one has got the best out of an experience. But even here we are on the borders of pleasure of achievement, that of reaching a goal set up, an intellectual pleasure that may be put under the heading of function. Many intellectual aspects of cognition certainly modify the pleasure of functioning, giving rise to a large number of varieties. When there is general normal healthy functioning, even without any stimulation to greater activity, there is a pleasure accompanying it. This pleasure is not localized with the activity of any particular organ or sense-mechanism, but is diffused over the whole organism. It is not prominent in consciousness but expresses itself in an outward calm and pleasantness. It is the *joie de vivre*. This may well be called the pleasure of satisfaction. It may never be quite perfect, but it is always present in some degree as long as there is consciousness ; however, any noticeable pain may eclipse it for sometime. Each one, even the most miserable, enjoys life in some measure and clings to it. It is very seldom that a person is so afflicted in mind or body that he longs for death. Such cases do not justify us in denying this general sort of pleasure in life. Relief from pain is not altogether a negative feeling, as there is the emergence of the underlying pleasure of functioning.

55. Buehler's third kind of pleasure is the Pleasure of Creation. To us it seems that this sort of pleasure is included in that of functioning. It is, however, supra-sensuous or intellectual, the accompanying cognition always having an intellectual aspect. Under this head Buehler places the pleasure of achievement to which we made reference above. The pleasure of power or ability to function is reducible to that of functioning, if we allow for intellection, for active memory, abstraction and active association, for reasoning and judgment. It is an intellectual pleasure, even though it may refer only to physical power. It is more intellectual when it refers to power exerted through others, i.e. in the social sphere; and still more when it refers directly to intellectual abilities. The pleasure attendant on the recalling to mind of power effectively exerted is the pleasure of achievement. The activity involved in achieving engenders the pleasure of functioning; the mental activity recalling the end in view, the active adoption of means to the end, the pleasure of functioning in the process—of overcoming difficulties of various sorts—and the knowledge of the successful termination of the process and of the fitness of the whole mental plan, is the pleasure of achievement. When there is reasoning and judgment of one's own and a sense of uniqueness of the product, it may be called the pleasure of creation. The pleasure of achievement is at its climax with the full realization of the import of one's work. It soon drops and rises again only in memory.

56. Thus the main types of pleasure may be put down as the sensual or physical and the intellectual or mental, with many admixtures between. When we say that a pleasure is intellectual, we do not intend to imply that there is no lower functioning and lower pleasure attached thereto, but that the pleasure of intellectual functioning is dominant and gives its tone to the whole mental process.

57. Intellectual or mental pleasure is of a higher kind than sensual pleasure, not only because it is engendered by the higher activities of man, and is not localized and associated with any particular organic mechanism, but also because it is of a more subtle and enduring nature and in a sense most agreeable to man as man, and most conducive to his complete well-being. Intellectual or mental pain on the other hand is in general more dreaded than physical pain and works much more havoc with the psycho-physical organism. Again, intellectual pleasure knows no bounds of its own; we may seek for it without satiety, and its renewal in memory also contributes to one's well-being; moreover, it does not agitate the body as much as a revived sensual pleasure does. Thus there is a greater natural tendency to recall pleasurable events, especially of the intellectual type, e.g. achievements, than painful events, e.g. failures. That is why we often speak of the 'good old days'. There are of course limits to mental pleasure and pain which we may experience, for these feelings, however intellectual they may be, are attendant on bodily activity and the latter obviously has definite limits.

Theories of Pleasure and Pain.

58. Plato held that pleasure was negative or relative, being merely a transition from pain. Aristotle, in his *Ethics* Bk. X, taught that there were also positive pleasures, other than the satisfaction of bodily cravings. Pleasure is a positive concomitant or the resulting quality of the spontaneous healthy exercise of some vital function. To each of the 'faculties', i.e. the 'senses' and the 'intellect', he attributed a distinctive pleasure, (quality of activity). The intensity of the pleasure depended partly on the fitness of the faculty or habit and partly on the nature of the stimulus. The greater the energy of the faculty and the fitness of the stimulus to elicit a lively response from it, the keener the pleasure. The most perfect pleasure gives the

greatest delight. Again, pleasure is not only an effect of the exertion of the vital energy but it also reacts upon the energy from which it arises, stimulating it and perfecting its development. Pleasurable feeling is at once the result and the final complement of vital energies. Pleasure is attendant on every sense as well as upon every intellectual act, the most perfect being the most pleasant. The greatest pleasure arises when the perceptive faculty is the most efficient and energizes on the most appropriate object. The duration of a pleasure is likewise determined by the nature of the stimulus and the state of the faculty. So long as there is a harmonious relation between these two factors, i.e. so long as the faculty is fresh and vigorous and the stimulus suitable, the experience will be agreeable, activity being easy, spontaneous and proportionate to the faculty. But indefinite exertion is impossible; the activity becomes relaxed or fatigued, the pleasure decreases and is finally succeeded by pain. Hence the need for change. Vital vigour is at its maximum with a new experience, but it decays with the continuance of the experience, and as the activity gets less perfect the pleasure proportionately wanes. Agreeable feeling, therefore, accompanies the exercise of our faculties so long as that exercise is spontaneous and free. Pleasures differ in kind inasmuch as they are the perfections of the activities of different faculties. The pleasures of conflicting activities neutralize each other and even result in pain; for by the conflict the activities deteriorate, just as when they are improperly exerted or aroused by an unsuitable stimulus. When the energies are exhausted or obstructed, the experience is disagreeable. Superior energies beget nobler pleasures.

59. Thus the ancient Greeks propounded views on pleasure and pain which embody the main features of all subsequent theories.

60. Spinoza insisted on the relative nature of pleasure. For him, pleasure was "the transition from a

less to a greater perfection ". Kant defined pleasure as "a feeling of the furtherance or promotion of the life process", and pain as "the feeling of its hindrance"; but, he held, pleasure always presupposes previous pain, as such promotion always implies resistance to be overcome. Schopenhauer, following Plato, like Kant and Spinoza, insisted much on the negative aspect of pleasure as agreeable feeling of escape from pain by the satisfaction of some want.

61. Descartes and later Leibniz hold that pleasure consists in the consciousness of perfection possessed. Hamilton adheres more closely to Aristotle. Bain enunciated his "Law of Self-Conservation" thus: Pleasure is the concomitant of an increase, pain of an abatement of some or all vital functions. Later psychologists tend to the Aristotelian view, though insisting on an underlying organic process, viz., the integration or the disintegration of the neural elements involved or the adjustment or maladjustment of the organ to the stimulus or general environment. Herbert Spencer generalized further and adapted this view to the Evolution Theory: pleasure is the outcome of organic equilibrium, harmonious functioning; the concomitant of normal medium activity of an organ, and is consequently beneficial. Excessive or defective exercise results in pain, and so tends to cause a return to equilibrium. Pleasure and pain are protective factors of primary importance in the struggle for life. More recent views on feelings will be discussed in the Chapter on *Hormic Psychology*.

CHAPTER VII.

INSTINCT AND LEARNING

1. Instinct is an inherited regular, automatic, inflexible mode of animal behaviour, appearing at certain definite times in the life of an animal and directed in general to the well-being of the individual or of the species.

2. Instincts are inborn habits that do not have to be learnt; nor do they improve with practice. Maternal instincts may be seen in a hen : brooding, clucking, feeding, defending her young, and so on. A bird makes its nest, bees build their hive, a spider its web, a caterpillar its cocoon, a badger its house, by instinct. They can do so without ever having seen it done before. Even though it may occur only once in the life of the animal, as, e.g. making a cocoon, it is as perfect as can be. The cycle of instincts in the life of the common worker bee is well known. In its short life it does successively different jobs in a regular unchanging order, and each job always in the same way without any schooling. It is probable that a particular instinct is set going with a particular chemical change in the body of the bee. These chemical changes are never reversed. Each instinctive action changes the bee's constitution and it goes right through the series. Experiment has, however, shown that the changes can be accelerated or retarded, and so correspondingly the advent of the instinct. It has been shown also that hormones are closely connected with instincts. Thus an animal of one sex has been made to display the instincts of the other sex by operation, e.g. of grafting.

3. All evidence goes to show that an animal is not conscious of the purpose of an instinctive action or the end to which it is directed. The result of an action is sometimes of a type that is never seen in the

life of the animal. Moreover, the animal does not vary the action, even though to us it may seem that a variation is profitable in special circumstances. There is a bigger wasp which will drag its victim—a caterpillar or a grasshopper paralysed by a sting—only by the antennae, and if these are removed it will abandon it rather than tow it along by the legs. A spider will only attack a fly if it is caught in its web.

4. When conditions are not the natural ones such instincts are very striking, showing that they even keep the animal from adapting itself to its surroundings, e.g. scratching a cemented floor by a hen even though the grain scattered on it is quite visible, hoarding by a tame squirrel, burying of a bone or turning round and round by a dog before lying down on a carpet, the motion of covering up the foeces by a cat even on a hard floor, the flattening out and immobility of chicks at a warning call from the mother even when their camouflage does not work, the follow-the-leader procession of one sort of caterpillar that is accustomed to seek for food in single file head to tail, when made to go round and round in a closed ring.

5. To those who observe and interpret, the most striking trait of an instinct is its purposefulness. We say that it is of use to the animal ; it fits in perfectly with its life. But some instincts would seem to be imperfect, e.g. the sucking instinct in the young of mammals, which would often suck at anything soft and projecting; the ant's instinct of rearing a certain kind of beetle for the sake of the sweet juices these produce, even though in the end these beetles destroy the brood of the ants; the instinct of feeding the young, even though the young one happens to be a cuckoo which would kick out the legitimate offspring from the nest. On examination it will be seen that the general rule of purposefulness is not broken. In some cases a more general purpose in a wider scheme—e.g. to keep the "Balance of Nature"—must be conceded ;

in others the purely instinctive part of the behaviour must be distinguished from that part which needs to be acquired. In other words, what is thought to be a complex instinct may turn out to be made up of a simpler one to which is added acquired behaviour. A cat catches mice; but it is only the mode of catching and the imitation of its elders which is instinctive, and that a kitten can be brought up on friendly terms even with mice, is well known.

6. The benefit to which the instinctive action leads could not have been known to the animal. It is moved by the physiological changes going on within it, and it reacts to external stimuli also. The zoologist is as much interested in these as in the question of the particular end of each instinct. The migrations of salmon, of eels and of birds, offer a wide field for study.

7. It is undoubted that insects are guided wholly by instincts, and that instincts play a large part in the lives of birds. Mammals have fewer instincts, and they are in general of a less complex nature. Human beings have the fewest and the simplest instincts. We may enumerate some: self-preservation, maternal care, follow-the-crowd, be-first-in-a-crowd, and so on. It will be noted, however, that in place of the complicated instincts of insects, the higher animals exhibit modes of behaviour which may be analysed into acquired or learnt habits grafted on, as it were, to instinctive behaviour. As we go up in the scale of animal life, we find in general a greater variety of external stimuli and finer differences between them to which the animal reacts. Consequently the higher animals are subject to more complex experiences than the lower ones and have also a greater need for adaptation. This is provided for by the greater flexibility and applicability of their instincts.

8. Besides form, size, and coloration, i.e. external appearance, one individual of a species is

distinguishable from another by its individual behaviour. Insects cannot be so easily distinguished, as their behaviour is almost stereotyped. Birds may be distinguished also by some acquired individual traits. Individual animals, however, undergo more varied experiences in their lives and react accordingly, so that they differ more from each other. This is particularly to be seen in mammals and more so in domesticated animals. Man with the fewest and simplest instincts varies most in individual behaviour, and is consequently the most determinate, from this point of view; he has the greatest degree of individuality.

9. Every animal has to learn something, even insects. Thus, a worker-bee in the final stage of its life when it goes abroad for nectar and pollen, gets to recognize landmarks, that it may find its way, and to discover nectar-bearing flowers. While winged insects fly perfectly in their very first attempt, birds have to learn to do so; but the course is very short. Flying for birds is an acquisition based on instinct. Puppies learn to walk; babies also, but they are very much slower in learning. All these are examples of muscular training. Swimming, cycling, running and jumping, need development and co-ordination of muscles; and we have to learn the movements—though intelligence may play a meagre part.

10. Learning is done by practice as well as by imitation. The more the animal's life is ruled by instinct the more quick is it to learn. But of course it cannot learn any and everything. What it learns must be based on its instincts and fit in with its life. Predatory animals teach their young how to hunt and what to hunt. A chicken pecks by instinct but it has to learn to recognize its proper food. This it does by imitation. It learns, however, very quickly. A yellow-hammer can never differentiate between the young of a cuckoo born in its nest and its own progeny. A hen will give all its maternal care to its brood of ducklings.

11. The imitative instinct is shown chiefly in the young, the adult animal almost never learning by imitation. The method of experience, i.e. of trial-and-error and of remembering to follow successful ways and to avoid errors, is perhaps the most common way of learning among animals. The instinct in the young to play at hunting and fighting is very useful to certain kinds of mammals, e.g. the carnivores. They have to learn with these instincts. But the play instinct is not only in young animals. Some fully grown animals also play and gambol about. It keeps them fit and they get rid of their surplus energy. Moreover, it gives the pleasure of healthy functioning.

12. We have mentioned above 'imperfect' instincts. Some would consider a moth 's predilection for a candle-flame to be such. But we must note that a flame or fire is not 'natural' to the life of a moth. It is an artificial or an extraordinary condition in its life. Instinct has no such thing in its perspective. A stranger (cuckoo) being born in its nest is also not 'natural' to the life of a yellow-hammer.

13. Some animals learn by experience more quickly than others; and even among those of the same species, e.g. dogs, great differences in aptitude may be found. But the manner of learning and the behaviour can only be what is according to the nature of the animal.

14. It has been claimed that some animals, e.g. apes, monkeys and dogs, can reason, in the sense that they can meet an entirely new situation and perform a purposeful action, selecting and ordering means to an end. The evidence for this is too meagre ; the number of instances cited and the nature of the experiments do not justify the conclusion, nor is the explanation of the behaviour by reasoning the only possible one. Moreover, scientists are not agreed on this point. Some animals are quick at profiting by experience and

remember to avoid past mistakes; the better the memory the more 'docile' the animal.

15. There are several theories among present-day experimental psychologists on the learning process of animals. The worst of it is that each school takes up one particular series of facts, illustrating its particular theory therewith and rejecting the others. We shall state three chief theories. First, the sensationists and instinctivists (e.g. Thorndike) state that learning comes from experience in the manner of trial and error, and this trial and error method of learning is exclusively that by which all animals learn. The reflexologists base their theory of learning on the fact of the conditioned reflex. Learning is but a conditioning. The gestaltists insist on insight as essential for any learning. Their theory of tensions closing the gap is put forward as the theory of learning.

16. Thorndike (b. 1874) conceived of learning as a process by which bonds or links are established in the neural system between the efferent nerves excited by the stimulus and the efferent nerves to the muscles which gave the motor response. He reduced to two the laws of this learning mechanism; the Law of Exercise and the Law of Effect. The Law of Exercise states that muscles are strengthened and adapted by use, weakened and rendered unadaptable by prolonged disuse. The Law of Effect states that those bonds gain strength and predominance that lead to a successful resolution of a situation, and those weakened that lead to failure. Pleasure of satisfaction to the animal resulting from the activity of some brain mechanism, strengthens that mechanism; pain or discomfort resulting from some other brain mechanism weakens that mechanism. The Law of Effect is but the first attempt at an explanation of why in trial and error learning successful reactions are stamped in or firmly associated with a situation and unsuccessful ones are stamped out or dissociated.

17. Thorndike concluded that an animal learnt blindly by trial and error, because the only other suppositions he could think of were learning by imitation and the use of ideas in reasoning or merely by association. The latter had to be ruled out by the evidence of the 'learning curves'. These showed a gradual though not very regular improvement and gave no indications whatever of sudden transition from not knowing how a problem is solved and knowing it. If the animal had at any particular time reached a solution by reasoning it would know it and always act correctly after that. Thorndike could not definitely say whether animals used ideas or not, but he was inclined to believe that they did not. Learning by imitation he could not find evidence for, as neither cats nor monkeys benefited by seeing a trick performed by another cat or monkey that had learnt it. Since, therefore, an animal did not learn by thinking or by imitating, the only possibility left was trial and error. They experienced a variety of motor responses to the situation, and by some blind gradual process unsuccessful responses were stamped out and successful ones stamped in.

18. Thorndike held that the learning process of brute animals was the basis of human learning. Man has a greater capacity for learning than brutes, and quickness and variety of learning gives man a basis for thinking.

19. The reflexologists rejected Thorndike's Law of Effect on the score that it referred to consciousness a state they wished to be unconscious about. The pleasure of satisfaction and the pain or discomfort that Thorndike had referred to, might easily be considered as merely physiological states, yet the wording of the law was as if it were the consciousness of these states that came into play. They therefore sought to eliminate it in some way. The attempt to reduce it to the Laws of Frequency and Recency, by which frequency

of repetition and recency of occurrence give a balance in favour of a response, and which may themselves be considered as sub-laws under the Law of Exercise, did not prove satisfactory; for, as Thorndike pointed out, they ought to weigh equally or more in favour of an unsuccessful response than of a successful one. The Conditioned Reflex is now accepted as sufficiently replacing the Law of Effect.

20. The gestaltist's introduction of 'insight' into the process of animal learning drew attention to the unity of the perceptive process. The brain, they said, closed gaps by the merging of the activities of each part into a whole. They see all learning as a closing of the gap, which they call 'insight'. Instances of quick learning show that the animal sees a situation as a whole; it sees what it has to do together with the rest, and by reconfigurating the whole, closes the gap between the situation as it is and the goal. Insight, say the gestaltists, is essential to any learning.

21. There are several naturalists to whom learning by imitation is very evident, and who speak of the imitative instinct. In general, learning is a readjustment and adaptation of instinctive impulses to particular sorts of situations.

22. If we should accept all these four processes as fairly conclusively established by known facts, and grant also the corresponding doctrines of all the four schools (each of which would reject the other three) we are on a fair way to knowing better the mechanism by which brute animals learn. But to hold that man's modes of learning are confined to these, taken singly or even all together, is unjustified and unjustifiable. It does not consider man as man.

23. One special remark we must make on a point not taken into account by any of these schools. Learning is getting to know what to do and doing it—

unconsciously if you will—in a situation similar to a situation which the animal coped with successfully in the past. The item of *similarity* in either the behaviour or the situation is a philosophical one. The sensationists would refer to identity of instincts and to identity of impulses, the reflexologists would refer to identity of stimuli and to identity of responses, and the gestaltists would seize upon the identity of the configuration of the brute organism and upon that of the configuration of the situation. But 'identity' is a difficult word to deal with, and 'identity in difference' is a philosophical bugbear. So, say what they will, all their efforts are to tackle this bugbear and they cannot avoid philosophy. Similarity consists in more than mere quantitative equalities, and the configuration of the gestaltist is more than a mere geometrico-physical one. This is true even in animal psychology.

24. All the four processes are undoubtedly bases for human learning; but they do not by themselves represent the process of learning by reasoning.

25. Instincts have been considered as habits acquired in the course of generations and now become hereditary, or as habits surviving in a species by the process of Natural Selection. Let us observe again that the inflexibility of instincts is a factor working against adaptability, so that the more the life of a species is ruled by instincts the less adaptable it is to the changing environment and conditions, and therefore the more doomed to extinction. But this seems to be quite against other scientific conclusions. Darwin's theory of Natural Selection does not account for the origin of instincts. On the other hand it raises up greater difficulties. The other theory is not substantiated by observation. If there is evolution to higher and higher forms, it is clear that this evolution tends in fact to lessen and to simplify the instincts, and consequently to make lives more variable and also more adaptable. However, it is very doubtful if the highest

animals (excluding man) are really the most adaptable. If instincts were habits crystallized, as it were, by heredity, we should be inclined to reverse the scale of life and to consider a life governed wholly by instinct as its apex.

26. In regard to reasoning it is known that birds and some animals recognize a thing only in a familiar setting. A bird will not recognize its nest if it is shifted only a few feet away. A lizard recognizes its prey only if the latter moves. When an object is in an unusual setting, recognition is often wanting. This would show an inability to analyse. Biologists in general are rather diffident in attributing thoughts to animals. Some would say that the mentality of an animal is only a simpler edition of that of man ; that when a mammal's brain is similar to ours in structure it may have thoughts similar to ours, though much simpler. The brain of a bird is not developed in that part to which thought is attributed. Other animals have brains still less like ours.

27. Suppose it were true that some animals had once discovered that a certain action was most useful in their struggle for survival and that they communicated this knowledge to their offspring and that this went on through many generations until finally it became an instinct, the purpose of which is no longer known to the species : what will this show—evolutionary progress or regress ? Did the life of the species degenerate from reasoning and purposeful behaviour to instinctive and mechanical behaviour ? The assumptions themselves are such as no scientist worthy of the name will make.

28. Speech, as we have said elsewhere, is purposeful expression, chiefly through the breathing apparatus. It is a manifestation of reasoning by and to beings that reason. Animals certainly have means of communication. They make noises, and they have other ways of communicating with one another. They do not

have words or sentences. The noises some of them make correspond to exclamatory sounds that we utter. They also use movements of face or of limbs which express their feelings and needs. Many make use of smells; e.g. to keep together, or to recognize each other. The cries and grimaces of the young are instinctive. Even those of adult animals are not learnt. An animal brought up out of contact with any of its species knows all the cries and other expressions of its kind. The mode of communication of bees is entirely instinctive. They use smells and dancing.

29. The interpretation of these instinctive modes of expression by their fellows is also instinctive. When a bee has discovered a source of nectar and brought it home and delivered it to another worker, it starts to dance. Other bees join in the dance and after a while they all set off in search of the flower whose smell they have got from the discoverer. They discover the flower or flowers of the same sort even independently of the discoverer. She does not lead them on to the bush.

30. Some birds imitate the cries of birds of other kinds, even the speech of man. But these cries have no meaning to them, and express, if anything, only the joy of life and of action. When a domestic and circus animal responds to words of command, it is a case of "conditioned reflex".

31. Animals express their feelings by the noises they make. They also seem to understand the feelings so expressed. But we venture to say that it is not that they understand the expressions of their fellows but that they themselves respond in feeling and consequently in movement to those sounds just as they do to smells. Men have words for things and for thoughts and can make sentences. This cannot be said of animals. They do not converse. The cawing of crows and other birds when they congregate together can by

no stretch of imagination—except that of a poet—be said to be conversation.

32. We have already referred to a regular series of instincts in the life of the honey-bee. Instincts also recur at regular intervals. This is true not only of feeding in all animals, but also of migration, and of all the movements in the sexual life of animals. In the case of some insects the sexual act is performed only once in their lives, which come to an end soon afterwards. Movements are diurnal as well as seasonal and annual. Scientists seek to discover what the signal is for an animal to do a particular action and what internal changes and external stimuli lead to it. We must note that the changes themselves follow in series and any one depends on the one before. It has been shown that migrating and breeding movements depend chiefly on the length of daylight. Light makes the pituitary gland in birds more active, and the hormone discharged by this gland into the blood acts on the brain and sets the breeding process going.

33. In the matter of memory we may say that the feats of memory exhibited by animals are remarkable. Instances will be superfluous. The wonderful thing about it is that in some cases even one experience suffices. Salmon have a homing instinct. They have to learn, however, to find their way back to the home of their youth. Pigeons are quickly trained to find their way quite well with one experience. Migration is still a mystery, but a great deal of attention has been paid to it. In the case of fish, temperature and current as well as the length of daylight play a great part. In the case of birds not only the length of daylight, but also prevailing winds, temperature and humidity and perhaps also the sense of smell of land and water and vegetation, must be taken as determining factors in their movements.

34. Together with a wonderful memory for

sense-impressions, we must add a sense of direction. In Malabar, it is said, there are some persons who will immediately point to the north if suddenly asked to do so in any closed room or even when awakened from a sleep. It need not be assumed that they sense the magnetic lines of force. Once their position is fixed then even after several gyrations they retain the sense of direction. This phenomenon is not common among human beings. Very probably animals and especially birds have this sense of direction in a greater degree. Such a sense seems to fit in well with memory of a path. In Malabar a knowledge of the points of the compass is essential for those who would perform certain religious rites, and so they are constantly referring to them. Racing pigeons have to be trained over courses, but that they do not depend only on landmarks is clear from experiments. Actually we have a sense by which we know whether we are upright or upside down. It is a mechanism in the ear that gives us this sense. Also one knows how much one has turned in a dark room. The cochlea in the ears tell us this. If, however, you are spun round rapidly you lose this sense of direction; you are giddy; the mechanism has been put out of order for a time by the rapid rotation. By the aid of this mechanism we are able to keep our balance. A strong sense-memory added to this sense of direction will certainly help animals very much in finding their way without visual aids. Insects, fish, birds and animals, have some senses more refined than man and also some which man has not got. A fish has a sense by which it knows when it is swimming towards an obstacle. It has tiny organs along the middle of each side of its body which detect differences of pressure of the water as the current formed by the fish's movement is reflected back off the obstacle. Although man is devoid of the super-sensitiveness of insects and animals, by reasoning he has equipped himself with ways and means to substitute not only all the peculiar senses of lower beings but also to surpass them in delicacy and efficiency.

To mention only one, we have the marvellous invention of Radar. It is a radio echo. Short impulses of radio energy are sent out, and a portion of it is reflected back by an object in their path. The direction is found, and the range is ascertained by measuring the time that has elapsed between the transmission of the impulse and the reception of its echo. When it is known that radio waves travel with the speed of light—186,000 miles per second—the ingenuity of the device may be marvelled at. Radar has been the greatest single device that has helped the Allies to victory, in the air, on land, on and under the sea. Thus, the peculiar sense of fishes has been more than compensated by reason in man. Whereas it is just a natural urge that directs instinctive behaviour according to the animal's sensations, it is the end in view that guides the pilot of an aircraft as he watches the response of the 'magic eye' ('mickey') on his dash-board. Other illustrations of the observation made above will be superfluous.

35. The instincts of an animal are no doubt intimately connected with its structure. They may be said to be modes of vital reaction of the animal, expressing potential relations of vital reactivity with the external world, and consequently closely knit up with the internal relations, potential and actual, of its mode of being.

36. It has been said that animals have an *Instinct of Death.* The evidence in support of this are: (i) the popular belief that certain animals, *e.g.* the elephant, have a common graveyard to which they proceed when they feel the approach of the inevitable end, (ii) the peculiar habit of some animals in 'shamming' death, and (iii) the 'death-cry' of animals when mortally wounded by the violence of man or beast. In this connection we should refer the reader to the *Journal of the Bombay Natural History Society*, vol. 46, pp. 397-398, 399-400. The so-called 'facts'

do not warrant any assumption of a knowledge of death or an instinct of death. (See also B. N. H. S. Journal, vol. 45, pp. 414-415.)

37. Let us now draw attention to a very important point. An instinct, as such, is never an object of observation. Certain peculiar modes of conduct are observed and a potential relation perceived under the term Instinct. Instinct is a hypothetical idea introduced for the purpose of classification or of isolating qualities of action towards a better understanding of it. Instinct is on the same level as Force in physics. That an instinct is an 'urge' or 'force' in an existent entity is not only an unnecessary assumption but also a misleading one. It would be a "fiction" to attribute existence to it in such a way as to believe that it is there in the animal only waiting to show itself. Like 'force' it exists only in the manifestation. We should, therefore, use the word "instinct" only to indicate "instinctive behaviour", *i.e.* behaviour viewed only under a particular aspect. The danger of fictions is Atomism, the equating of an organism to the mere aggregate of its parts.

38. An instinct is analogous to a Reflex in this, that a particular situation gives rise to an appropriate reaction. A reflex presupposes that the mechanism by which it is brought about, the "reflex-arc" is in normal working order. It is a movement away from equilibrium. No one has found it necessary to assume the existence of a "reflex entity" inhering in the mechanism. The reflex arc is moved to activity by the adequate and proper stimulus, without which there is no "urge" to movement. The movement is rather in the nature of a Reaction than of an action. In an instinct, the change of state giving rise to it need not be directly brought about always by an outside agency. It may originate from internal changes in the organism. Instincts are activated by "appetites". This is the same as saying that a movement is somehow stimulated

and initiated, gets into consciousness and is experienced as an "urge". If the term instinct is used for the urge itself, then there will arise a serious ambiguity. Thus the feeding-instinct is brought about by an "appetite" which is the mode of experience of an insufficiency of nutrition in the tissues; the rest-instinct by an "appetite", the mode of experience of the presence of certain chemicals in the muscles; the sex-instinct by an "appetite", the mode of experience of the presence of secretions into the blood of the ductless glands. Even in a reflex the stimulus may be the result of changes occurring entirely within the organism; *e.g.* the opening of the pyloric muscle shutting off the stomach from the intestinal tract, or the change in frequency of the heart-beat, or the secretory activity of the suprarenal gland.

39. An instinct is a more complex reaction than a reflex; it is the synthesis of a series of reflexes following one another interdependently according to definite laws. The mechanism is therefore of the same sort but more complex than that of the simple reflex; and the situation in which an instinct occurs and which it has to face is consequently more complicated and specialized.

40. The chief difference between reflex and instinct, however, consists in this; that the former occurs to a large extent unnoticed; the latter somehow comes into consciousness. In man it can be consequently, to a great extent, under the individual's directive control. It can be excited and it can be inhibited. It can be directed to or deviated from one or other of its objects. Since an instinctive movement is a series of co-ordinated reflexes, it is evident that the higher levels of the central nervous system must come into operation.

41. An instinctive movement is often called an "involuntary action". This is because it is consciously

experienced and can be subjected to volitional control, and is in externals similar to a consciously controlled act or to a habitual act in which conscious control was at some time exercised, though actually it is devoid of a volitional aspect. In instinctive behaviour there is an objective plan, and this plan can be subjectively apprehended. Moreover, it is a co-ordination of reflexes, and in it the higher brain centres are involved. Again, instincts are fixed in their general outlines but not in their particularities. In the lower animals these become fixed by acquired habits. In man, instincts are the basis of volitional activity and subject to active modification.

42. We shall now mention another class of movement to which we shall give the name Impulsive Action. The term "impulse" or "impulsive action" is here taken not in the ordinary physiological sense but in a special psychological sense which is very much the same as that of common usage. In psychology the term "impulse" is often used to mean the same as "urge"; but we desire to distinguish between an "impulsive action" and an "instinctive action". It is in externals similar to instinctive action, but differs from it in this, that not only is there consciousness of the whole action, while it proceeds, as in the case of instinct, but also a prior consciousness of an end in view, to which the appetency is directed. It differs from Voluntary Action in this, that the means are not consciously ordained to the end; the plan of action is haphazard or depends on the general instinctive tendency, the desire of the end being so strong and the urge so insistent that conscious planning is precluded and rapid movement resorted to. This is what we mean when we speak of a certain person as impulsive.

43. We have already referred to the relation between "satisfaction" and the appetite-urge. The term is used in two important senses: for a pleasurable feeling equivalent more or less to "contentment", and

for the fulfilment of a need or desire. We shall use it in the latter sense. According to some an instinctive action comes to rest at the moment its object is attained and the desire "satisfied". This is not true even in the nutritional urge. There is a sort of "inertia of motion" or "momentum" in a physiological movement which when pursued is likely to carry on beyond the degree of satisfaction. That is why there is over-eating, over-sleeping, over-exertion, etc., especially among children, and not seldom among adults. Pleasure, as we have noted, is connected rather with sensation accompanying the mode of satisfaction of an appetite, the latter being often intensified by the increasing pleasure. There is also pleasure in movement in the exercise of power. K. Buhler designated a form of pleasure, *Funktionslust* which may be rendered "the pleasure in right function". This is an organic pleasure accompanying movement, and generated by it. It is not brought to an end by the pleasure generated; but rather is the pleasure a stimulus to greater activity, so that it is continually increased. It is the other conditions brought about by the activity that put a stop to the pleasure, such as fatigue, strain, etc. This sort of pleasure is connected with the play instinct. Objectively, the purpose of play in animals may be the liberation of surplus energy, the organic development and co-ordination of muscular activity, the exercise and formation of such habits as would be of use to the animal in adult life, e.g. hunting its prey, escaping, jumping and climbing in precarious positions, etc. The play instinct is only found among the higher animals, and there is every manifestation of subjective pleasure. The appetite or urge in the case of this instinct, initiated by a surplus of energy, is heightened by the pleasure generated.

44. There is again an instinct connected with an urge, the instinct of self-preservation. If there is any pleasure in having escaped danger—in animals other than man there is certainly no indication of it—it has in itself no quality of the satisfaction of an urge, nor does

it bring the urge to rest, nor is it directly related to the final situation. The urge is to equilibrium with the surroundings to an "adaptation". Hence the contention that all action is directed to pleasure cannot be upheld. It is a projection by hedonistic philosophy of its ethic on the plane of biology, setting up pleasure as the only possible goal of action. If there be conscious direction at all by the subject, it would be negatively, to avoid pain; but the pain can only be by anticipation; but while not present in representation, never having been experienced before, it cannot be the actual stimulus to the urge.

45. Pleasure is one of several possible goals of action which share in common the fundamental characteristic of realizing in experience a definite vital value. An urge is the directional aspect of an activity, which is to some future situation to be realized. Conscious animal behaviour shares with voluntary action the same mechanisms in common. In voluntary action the end in view, the event to be realized, is the starting point, and, as it were, the norm or guide to the details of the whole movement; the understanding and the recognition of the "worthwhileness" of the situation to be realized precede the whole action-complex.

46. Impulse, as we have defined it, may be said to lie between Instinct and Voluntary Action. It has a volitional aspect inasmuch as the end is consciously in view, desire is directed to it, and action is stimulated by the desire. Thus in impulse as in voluntary action the urge comes from an anticipation, the mental representation in the present of a situation to be realized in the future. In voluntary action, however, the situation may represent not only a vital value, i.e. one connected with the physical well-being of the individual or species, but also higher values, which may be called intellectual or moral on account of certain aspects they bear. Moreover, the means are chosen and disposed in relation to the end and the movement carried on in spite of organic urges.

47. That there is anticipation even in animal reactions is true. A dog yelps when I swing a cane at it, even though I do not actually cause it pain ; another may growl at a man carrying a stick. The anticipation of pain is by association from previous experience. But the anticipation in voluntary action need not be occasioned by direct association with an external stimulus. In instinctive action each situation is associated with the immediately next by experience; whereas in voluntary action the associations themselves are controlled, being retained or discarded according to their relation with the final end.

48. In instinctive action only vital values are realized. The outcome is always within the sphere of individual and organic life. Even if objectively it extends beyond this, as e.g. the sex-instinct, which serves the continuance of the species, yet the urge *as experienced* has no direct relation with procreation. Where this aspect does appear in sexual acts it comes from knowledge, which is in a higher sphere and, as an urge to action, is superimposed on the individual organic sphere.

49. The strength of an instinctive urge, its "urgency ", depends on the subjective position accorded to vital value associated with it in experience. Three considerations may be made : (1) the realm of reality within which the vital value is realized is the organism, and its strength is consequently dependent on its conditions ; (2) psycho-physiological associations have their own natural potency; (3) any volitional control is faced with special difficulties, but is possible, as we know from experience. The facts that the scale of subjective values is never constant, that there is an objective scale, and that the subjective scale can be actively modified in spite of the strength of organic urges, are significant.

50. A proper understanding of instinctive action

is necessary that we may be able to detect any higher aspect in human action.

51. There was a time when it was largely held that all mental facts could be considered as complexes of "sensations". This doctrine, set up not on the strength of empirical evidence but for the requirements of the philosophy of materialistic determinism and empiricism, proved very unsatisfactory. The elementarists, whether of the dynamistic school, who wished to reduce ideas to forces acting on each other in the manner of physical forces, or of the chemistic school, who wished to reduce to "elements" reacting with each other to form "compounds", could not reduce in an intelligible and demonstrable manner facts like judgment or purposive action to sensations, nor did the doctrine fit in with other facts. The monism of the materialists assumes that mental and material phenomena were essentially of the same kind; the latter could be reduced to elementary facts, so should the former. Sensism could not explain the peculiarities of the "higher" mental states, nor the manner in which or the reason why complexes of sensations existed at all. Sensations would not do; another "material" or "element" out of which mental phenomena could be built up had to be found. "Instincts" were adopted by some and "reflexes" by others.

52. For Freud's conception of instincts and of their position in human life, see the chapter on the *Psycho-analysts*.

53. A scheme of psychology very much based on instincts is that of the McDougall, for which we refer the reader to the chapter on *Hormic Psychology*.

54. Watson's views on emotions and instincts will be found in the chapter on *Behaviourism*.

CHAPTER VIII

SOME CHARACTERISTICS OF MAN

1. What is that being to which we give the name Man? What does the term which applies equally to you and me connote? Some will put off this enquiry on various pretexts. Some say that if you fix the meaning of the term then your study of Man will be biassed or limited by your definition. Others say that we do not need a definition—*What is*; we need only know *how* Man behaves. Others again declare that any definition will involve questionable assumptions which it is best to discard at the start, or that it will involve other terms which themselves will need to be defined.

2. But whether we wish to be free to include in the denotation some prehistoric *anthropos* or to be able to say decisively when a foetus may legitimately be called human, it is clear that some general idea is required, either on morphological or on physiological or on some other lines. We need to *recognise* and *distinguish* that whose behaviour form or function we study. Assumptions will be investigated and notions clarified in the process; the essential and the non-essential duly set apart. There may be doubtful cases, but there is certainty also in many cases, and we may restrict ourselves to these for the start. I am certain that the mental isolate 'man' applies to me; and I am equally certain that it applies to the reader; and all agree in this.

3. I can know what a thing is by studying its structure and behaviour, which is a manifestation of itself. If this be not quite true, I can at least say that it is that which manifests itself to me in such a manner. Anything is *a set of energies fitting into a*

plan. I apprehend myself as a human being, and I put others in the same class. I have experiences within myself of which I am conscious, and I am conscious also of the expression given to them by external movements associated with internal ones. I have desires, feelings, thoughts, and external manifestations of these. I find similar manifestations in others. These arouse desires feelings and thoughts in me. I and those others are in one class—Man. I interpret the behaviour of another in terms of myself by a sort of **subjective sympathy**. I **infer** that he has a **mind** and is of the same plan as myself. I am conscious of internal energies of various sorts and of reactions with energies outside myself, of movements within myself and of movements within a larger environment. I apprehend manifestations that are independent of my apprehension and the manifestations of one thing independent of those of another. My apprehension comes by my reactions to them. I find plans in the world. Anything may be considered an **individual** if it is a set of energies with a complete plan. It may form part of a larger plan; in which case the relation between the objects is that of part and whole. A plan is a manifestation of the co-ordination of parts to an end and of the subordination of each to the whole; in short, of **unification**. To see a plan is to see an end, a **finis**.

4. I apprehend myself in a vague sort of way, as one in myself and distinct from others. This notion of the self I shall call the *Ego*; the Ego is an image of the self. This image is never at any time clear; nor is it ever fixed or full. The apprehension is generally only some simple aspect or another; a set of simple images unified into a plan.

5. Apprehension is based on familiarity. An experience needs to occur more than once to be taken as a matter-of-course. It is then accepted as belonging to a set, as part of a scheme of things. This is true not only of my experience of external things, but also of

the self by the self. Memory is involved in apprehension. One accepts the fact of sugar disappearing (dissolving) in one's tea only by familiarity. If by accident the knob of a switch has to be pushed up instead of pressed down to put on the electric light, a child is puzzled over it. He finds a difficulty in accepting it, until he comes to accept it by familiarity.

6. My study of the external world cannot be entirely objective. There is always a subjective element. Even in the physical sciences, where we strive to attain scientific objectivity, we have a social subjectivity, and I am a part of society. My study of man as man can still less be dissociated from the subjective element. For I can only understand another by interpretation of his manifestations as a human being ultimately in terms of myself.

7. Desiring, feeling, thinking, doing, each has a twofold aspect: a subjective one corresponding to the experiencing or the consciousness of it by the subject and an objective one corresponding to the manifestation of it or the way in which the experience is shown outwardly to another. The subjective aspect can only be interpreted by the external onlooker by analogy with himself; but the subject can aid in this by expression intended to make known his experience. This purposive expression is necessarily imperfect, because the mental processes aroused in the observer can never be said to be exactly equivalent in any case to those experienced by the subject. Thoughts, feelings and desires are intimately connected, and they enjoy an individuality. Each fits into a mental plan, unique in its details. But that there is a general plan on which all minds are made up, is not only an assumption necessary as a working hypothesis, but also one sufficiently demonstrated by facts. These facts are society and social intercourse; knowledge, the accumulation and co-ordination of knowledge; the study of the human mind,

8. Speech, in the broadest sense, is the purposive manifestation of the subject's experiences. It can never be perfect ; but it is in general sufficiently expressive, and not always the worse for being imperfect.

9. Living creatures, like inanimate things, show objective appearances of change; but, unlike inanimate beings, they experience change subjectively. In plants the behaviour is as " vital action " ; in animals there is manifestation also of consciousness, of recognition, of feeling ; in man there is, in addition, the manifestation of thinking and willing, of significance and purpose. There is a plan, a pattern, in the activity of man such as is not found in other creatures. Man, who belongs to all the three natural " kingdoms ", has the greatest degree of understanding. We can have the highest sympathy with our fellowmen because mental processes can arouse similar processes, the more so as human thoughts, feelings and desires are interconnected. We can have sympathy also with brute-animals because they manifest certain processes losely resembling our own. Inspite of this, however, we fail to recognise in them certain processes which we experience. We manifest all the internal processes of brute-animals ; but we have also reactivities peculiarly our own and distinguishing us as a single class over and above all other beings within our experience.

10. Man has been called a 'social' animal. Man, in general, belongs to a planned aggregation of individuals of our species. However, even though the aggregation may be natural or imposed by natural circumstances the plan is Man's. If he has accepted his social environment, status and function more often passively like bees and ants, he has not always acquiesced in them. Even the born slave or the pariah has it in his conscious power to make a modification, be it ever so little, in his social position and relations. Each individual is an historical factor and contributes to

history the forward movement of the human race towards its destiny.

11. A child inherits from previous generations a vast heritage of knowledge and experience as well as modes of external behaviour. Thus potentially he stands on the shoulders of his human forbears. He learns by his own experience and in his turn contributes to the accumulating family property. Thus he is in History and History is in him; he is a product of History and he is creative of History; his story—his individual progress towards his individual end—is but a miniature edition of History; his fortunes and vicissitudes are illustrative of that of the race.

12. To study our fellow-beings, therefore, requires a knowledge of oneself. When I consider the fact that I can know another only by interpretation of his actions in terms of myself, this becomes obvious. Nor can I know anything of a society and of its "collective mind" except in the same way, by reference to myself as being in society and of it.

13. The ancients developed psychology only by Introspection. This was carried to the extreme, and psychologists, instead of confining themselves to phenomena which all would accept—in order to get "scientific" objectivity—went off into fanciful dreams, mystical wanderings and fantastic speculations; perhaps because there was little left to exploit; but they might have striven to consolidate their knowledge and make it more scientific. In recent years, the reaction went to the other extreme. Nevertheless, some recent schools, e.g., those of Freud, Jung and Adler, have recognised the value of introspection, and first and foremost of the necessity of knowing oneself; whereas the purely empiristical schools, discarding introspection altogether, have turned out to be rather barren.

14. To refer once more to History. The progressive movement of the whole human race made up

of large groups and ultimately of individuals, is not a straightforward uninterrupted smooth advance towards its end. The stream of human life falls over rocks, cascades down precipices, throws up showers of spray, dashes down frothing and bubbling, deviates and winds about, getting slower and slower but wider and deeper, until it finally reaches its destination. So it is with human progress. When we speak of progress, we refer not so much to comforts and amenities of life and the greater utilization of the powers of nature, but to the development of social man in regard to his highest qualities. This progress there has certainly been: not merely in an advance in technique and an accumulation of knowledge and a greater material application of wisdom, but also in the attitude of man to himself and of man to man, in a deeper and more extensive brotherhood, a striving to that state where the good of each will be merged in that of the whole and they will no more be in conflict, the parts being duly subordinated and co-ordinated into a whole and the whole bound together by the union of wills—"That they be one as we also are one". (John XVII, 11,22.)

15. Man is a social animal not because he seems naturally to prefer the society of his fellows, but because he is so dependent on society and it is so necessary for his own individual development and for the full play of his characteristically human powers.

16. Man can learn from the experience of others. Knowledge is transmitted not by congenial inheritance but by passing on experience in significant form from one individual to another, from one shore to another, from one age to another. The experience is recorded not only in writing, but also in traditions, in customs, etc. The records can be reinterpreted. An individual's personal experience is far below his actual knowledge, most of which is due to his position in society.

17. Man's behaviour is most significant to man

for one man can display to another the subjective aspect of his mental processes of desiring, feeling thinking and willing, on account of sympathy, explained above. Man anticipates pleasure or pain; he deliberately plans ahead; he arouses a present image of a future state and directs his actions to its realization. His external behaviour discloses also to another a plan; it is significant and intelligible.

18. Speech in particular distinguishes man from mere animals. Speech is the purposive manifestation of the subject's desires, feelings, thoughts, and willings. Man uses his physical powers and external environment for this expression. In particular he uses the muscles of the throat, the larynx, and the structure of that part of him through which he breathes, even in an elaborate manner, to produce significant sounds, rather than the muscles of his arms or face or of other parts of his body. Voice is most apt for its purpose of being intelligible, it is easier and less laborious than other means; it affects easily the sensitive organs of hearing, which themselves can be highly trained, it admits of infinite variations and modulations and these corresponds finally with the subtle internal movements of the mind. It can therefore arouse corresponding movements in the mind of another. Speech in its widest sense is not a deliberate invention to fulfil a purpose, though particular words were so invented after the purpose of speech was recognised. It was just the result of a striving to use every physical part of oneself for an external manifestation of the mental content that speech came naturally, as it were, and voice was found to be its easiest and most expressive mode. More than this, voiced speech, to which the term speech is generally restricted, can be recorded in symbols, i.e., written. These symbols can arouse the same movements of the vocal apparatus, or at least their inceptive tendencies, and through them the movements of the mind symbolized. The study of the nature of sound by Edison resulted in speech being

recorded permanently so as to be reproducible directly as such.

19. Language, however, i.e. the particular words and word-formations and aggregations, developed with the increase in the complexity of mental processes. A social group, partially isolated, would develop its own language, invent words and expressions in the measure of its progress. Language is a social instrument. A born Robinson Crusoe does not have a language.

20. Even words are not perfectly adequate for all purposes of expression. We resort to stress, intonation, modulation, pitch, vibrancy, facial expression, gestures with the limbs and body, meaningless interjectory sounds; and sometimes even then the hearer is not or does not seem to the speaker to be adequately informed. In general, however, we may say that speech admirably suits its purpose.

21. All mental processes are interconnected. I do not have a thought without feeling and willing. Consequently speech signifies a complicated mental process. It may be that the speaker intends to express the thought more than the feeling, or he may effectively express the feeling more than the thought. Generally speaking a word is a symbol accepted as such by a society or a social group and its significance is dependent on its acceptance by others. The same is true of verbal expressions and word groups. Consequently an individual needs training in words and their uses.

22. Again, speech helps to fix ideas, to formulate them more definitely and clearly and to co-ordinate them; it helps to recall mental processes more accurately; it allows the mind to undergo mental processes not otherwise possible.

23. Since speech is a conventional mode of expression, as soon as we put our thoughts into words

we give them some objectivity; we cut away a good deal of the subjective element in them. What is most strongly subjective is intimately connected with the individual's inner experiences, and cannot so well be expressed in words. The sequence of thoughts, their mode of connection, the rhythm, quality, tone and sequence of sounds, however, may help to express the subject's feelings, as in Poetry and Music.

24. The primary purpose of language is to express oneself, i.e., to manifest something of one's mental content. Difficulties arise in this expression from several counts. The speaker needs training and skill to use words in their socially accepted significance so as to express sufficiently just what he wishes to express. Besides the need for skill on the part of the speaker, any word itself has not a clear-cut precise significance. Every new word represents an idea in a state of flux, i.e. not precisely analysed and synthesized and only gradually acquiring a clearer and clearer meaning in an ever widening social circle. However old a word may be, new and strange uses are found for it and it is put into new combinations with others. That is why in the classical dead languages words and expressions have clearer and more determinate meanings and have become almost crystallized. Moreover, words arouse emotions of various kinds and in different degrees in different hearers at any one time and in the same person in different circumstances. Language also reflects innumerable fallacies and assumptions, once made and often retained in spite of their being exposed. Again, as language is a social instrument which becomes efficient only with uniform usage and acceptance by society, the varying usage of words and phrases leads to ambiguity. The meaning also of any word or phrase is determined not only by itself but also by its usage. Every form of expression is part of something larger into which it fits. All the circumstances in which the speaker was, must be included; and circumstances mean not only environment but also events happening at

the time and prior to the situation as well as the mental content of the speaker on which his reactions depend. In whatever manner the speaker expresses himself, the hearer may read in the expression either less or more than intended; for every expression in spite of its social ('objective') significance is associated with a subjective element in the mental process. The hearer has, moreover, to experience the same train of willings, thoughts, feelings and desires as those of the speaker; and this condition is never fulfilled, for obvious reasons. From all these counts it is clear that speech may not fully express all that and neither more nor less than the speaker intends to convey to the hearer.

25. Nevertheless, expression can in general be adequate for a purpose on hand. Normal speech more or less fulfills its purpose. This is more true when we remember that more often the speaker does not wish to express his emotive experiences, but only what is called 'pure' thought. Strictly speaking, this is not quite possible and in any case the emotive experience of the hearer will be there. All the same the expression of emotion by the one and the arousing of emotion in the other may be such a very minor concern as to be almost negligible. Thus speech may be 'objectivized' by the discarding as much as possible of the emotive aspect of words. A feeling, as something entirely subjective, cannot properly be expressed in words. When so expressed it is simultaneously associated with thought and it is the thought that is expressed, the peculiar mode of expression aiding the association. In this way is the feeling expressed, as *e.g.* when I say "I am afraid." A mere interjection "oh" may express surprise, fear, indignation, pain, amusement, etc., according to circumstances and mode of expression. But it is only understood by sympathy. In general emotion makes us incoherent in speech.

26. Science, in particular, aims at objectivity, and consequently at expressing and arousing as little

individual feeling as possible especially of the lower or violent biological types. Pure thought varies among individuals, but this is due to varying aptitude, training and interests. Feelings on the other hand vary so much more, and depend so very much on external circumstances and material and physiological conditions that their presence is inimical to reasoning. Science needs precision and economy in speech as well as independence in meaning from the circumstances of the expression. That is why there have been developed special scientific "jargons". No book is as dry as one in Algebra. The Logical Positivists have rendered us a great service in insisting on the need for clear definitions and exact formulation of assumptions, statements and questions. Mr. C. L. Ogden, the inventor with Dr. I. Richards of Basic English, recently investigated the incidence of 'fictions' in speech and 'magic of words'. It is surprising how much we deceive and are ourselves deceived by our words.

27. Scientific "jargon" is referential rather than emotive like art. But to consider thought-processes as self-existent independent entities is a serious mistake —probably first due to Plato. The individual is one in thoughts, feelings and desires; one in a material, social and historical setting. "In the realm of mathematical science," says Dr. H. Levy, "in which tremendous strides have been made in the mathematical explanation of many natural phenomena, there are outstanding scientists who maintain that the thought-processes of the mathematician suffice in themselves, without contact with any external reality, to answer all scientific questions that can be raised. To them, therefore, the universe is a pure thought, and in this confusion it is a short step to assert that this universe of thought exists only in the mind of a supreme being who is himself a pure mathematician. Because at this historical juncture such a type of confused thinking can be published and accepted by large masses of people, who naturally talk in the common

language and not in that of the logical positivists, or otherwise, of the universe, as one that requires examination and answering." (*Thinking*, Ch. III).

28. We have said that man's thought-processes, his desiring, feeling, thinking, willing, are interconnected ; in short there is only one thought process and it is abstractly placed into a class according to its predominant quality. Many even doubt if there can be thought without words. We ourselves do not go so far as to consider "words" here in the strict sense of sound symbols, or even as inchoate muscular movements of the speech apparatus. Thought, of course, is required for speech, which is only its purposive expression. We should accept, however, the dependence of thought on physiological movements without which there is no thinking as we human beings experience and understand it. Thus there can be no such thing as "pure" thought.

29. Reasoning is planned thinking. That there is a plan in every continuous thought-process cannot be denied. But the planning becomes more recognizable when the emotive aspect of the process is reduced so as to be negligible ; so much so that it becomes a prime necessity in cases where the thought has to be followed by others and accepted universally. Not only does the plan becomes simpler and more definite, but also it is more intelligible, more expressible and recognizable. Moreover, the plan is consciously directed by the mind more freely than if it were burdened with emotions. Then we have "pure" thought—which, however, is not so pure as it is claimed to be, though sufficiently filtered and freed from dross.

30. That planned thought can be so expressible and recognizable and in addition, so acceptable to others is evidence to the fact that human minds are of one plan. The human mind is not a separate entity with a habitation of its own, the brain; that which desires and feels and thinks is the whole. Mind is the

thought-process or processes as experienced. Every thought is itself a process. There are some thoughts acceptable by all persons of any one time and of all times. These are said to be "eternal truths." It is these that we strive to arrive at. It is these that are found to harmonize with each other and with which other thoughts are finally put into harmony. It is these which indicate to us that there is plan and harmony in the whole world.

31. Solipsism is a false isolation, the divorce of the individual from his context, of mind from man. To the Solipsist only his thoughts are "real", the rest but creatures of his imagination—"fictions". He appeals to logic as the test of truth. But Solipsism is itself a fiction, an artificial isolation. The Solipsist's vigorous attempts to convince another of his doctrine is itself an illogical behaviour. No Solipsist behaves logically. He uses language and illustrations from common speech and experience, "words that have no meaning except on the assumption that they refer to objects existing both for him and the rest of society" he uses logic, the science whose test is "objectivity", the science based on the fact that all minds have a common plan, and that the world from which or of which ideas are got is a great plan, far too tremendous for the individual mind. The Solipsist is such an argumentative fellow because he cannot even persuade himself and he hopes to overcome his perplexity at least by finding that others agree with him.

PART II

CHAPTER IX

PSYCHOLOGY AND PHILOSOPHY

1. We are going to study Man. We desire to see whether in his behaviour there is something special to give him the name *human*, and if so, what are his characteristics.

2. Man is an animal and from a morphological as well as a physiological point of view he is at the very top of the list of living things. It is very important to see how much he has in common with and how much he differs from those closest to him in the scale of life, and to investigate the nature of these differences.

3. We classify the behaviour of man under, headings of nutrition, growth, reproduction, sensation, feeling, locomotion, reflex action, attention, perception, judgment, volition, etc. But such a classification is based on the aspect taken of the operation and does not show clear-cut distinctions.

4. *Psychology*, the name given to our subject of study, is just as much a branch of philosophy or at least a preliminary to philosophy as any systematic study of a limited range of natural phenomena is. It is indeed the most important, for its subject-matter is the manifestation of what is generally accepted as highest in the order of classification of all concrete entities; it includes the very basis of all our investigations, and its relations to other studies are

fundamental to philosophy. Our notion of the entitity responsible for the human character of our behaviour will inevitably influence all our philosophical conclusions. Our investigations will inevitably lead us to a notion of the nature of that entity.

5. The inquiry into the qualities of our various mental states and operations have been variously designated as Introspective, Rational, Empirical, Phenomenal, or Experimental Psychology. It looks into human phenomena or investigable mental facts, such as are manifest to an observer, and not least such as can be frequently and repeatedly observed. It makes use of the results of other investigations, e.g. of Physics and Chemistry, and in particular of Morphology, the study of the structure of living organisms, of Physiology, the study of their functions, of Oecology or their relations to their environment, of Zoology and of Anthropology.

6. Psychology is the oldest of human studies. There was always a need to know human traits, to understand human actions. The ancients, e.g., Plato and Aristotle, had raised it to a position of dignity. Their observations and conclusions were of a high order and even now cannot be altogether rejected. However, for centuries at a time psychology was at a standstill, so much so that in such periods the argument that carried the greatest weight was an appeal to authority, to the dictum of a Master ; and instead of being a handmaid to Philosophy it often took its stand on philosophical principles not only of the most general sort but also special ones.

7. Psychology cannot be altogether alienated from philosophy. Indeed, the other sciences are brought into the realm of psychology immediately by philosophical principles, viz., the Axiom of Realism, the Axiom of Intelligibility, and the Principle of Causality. Without these there can be no Psychology, and

without a co-ordination of all our human studies there can be no Philosophy.

8. Every time there was an upheaval in the psychological sphere and a revival of interest in this branch of study resulting in a forward movement, it was as the result of a revolt against some established order or against some accepted philosophical principle or working hypothesis. Gradually a demand arose to break away altogether from the shackles of Philosophy and even from methods that savoured of it. The result today is that we have schools radically differing from one another as to the scope of psychology and its methods, and each one decrying the others.

9. Each school, however, is doing its bit and all, are together contributing to the rapid advances made. This would show that each one is following a profitable track and that only in a negative aspect it is wrong, at least partly.

10. Some of the schools say that they have entirely liberated themselves from the fetters of philosophy. We shall show subsequently that it is not so; that at least in their negations they bind themselves to philosophy, and not only colour their conclusions but each one puts thereby its own limits to its scope and methods. For the present we shall mention one example of a philosophical principle clandestinely introduced into psychology: "Mind and Matter are but two manifestations of one and the same thing."

11. Psychology as a branch of philosophy was largely ruled by Plato (C. 427-347 B.C.), and Aristotle (C. 384-321 B.C.), for centuries. The scholastics of the XIII and XIV centuries merely adapted Grecian psychology to Christianity. It then stagnated and became sterile, as there was no one to add anything new. In the XVII century Descartes and Hobbes broke

away from the traditional psychology of the time. They are supposed to have given us thereby the beginnings of modern psychology.

12. At any time there was generally someone ready to take the cue from some other branch of study which had recently made some startling strides, and to be influenced by the new methods introduced and the results achieved.

13. Even as early as the thirteenth century the Franciscan friar, Roger Bacon of Oxford, realized that a knowledge of the nature and behaviour of material things could be applied to improve the conditions of man's life. He did not, however, suggest lines of research, but only asserted the possibility of certain inventions such as the telescope and the mechanical propulsion of vessels.

14. In the sixteenth century Copernicus and Vesalius broke away from authority in the matter of Astronomy and indicated the basing of science on observation alone. Early in the next century Galileo invented the first great instrument of observation, the telescope, and also discovered the manner of falling of bodies to the earth and the laws of the pendulum. He thus made radical changes in the sciences of astronomy and of physics; and the method of experiment and observation became one of the permanent features of Science. Francis Bacon, Lord Verulam, about the same time criticised existing methods of studying nature and indicated how the study could be systematized. He relied chiefly on Induction (Logical). He also defined the aim of science as the improvement of the conditions of man's life by control over the powers of nature. Bacon's writings influenced for a long time the outlook of men of science, turning their minds to its practical applications. He displayed a marvellous imagination and foresight and made remarkable predictions, which began to be fulfilled

only two centuries later and have almost all been verified. He did not foresee, however, the utilisation of mechanical power and the acceleration of transport and communications. About this time Harvey discovered the circulation of the blood and prepared the basis of physiology.

15. Great progress in physics marked the second half of the XVII century, together with rapid advances in mathematics, with such great names as Tycho Brahe, Kepler and Descartes. Newton gave a tremendous push not only to mathematics but also to mechanics and optics, and he was followed by a string of great names. The principles which govern the working of simple machinery were at hand and many mechanical contrivances were invented, e.g., the pendulum-clock, the watch, the stocking-frame, the barometer, the air-pump, the sextant.

16. In the XVIII century there was rapid progress in craftsmanship as well as in processes of producing and working iron and steel. The production of delicate instruments improved our powers of observation. Contrivances to speed up manufacture to meet largely increased demands were readily forthcoming. Revolutionary discoveries and inventions marked the latter half of the century. In 1779 Lavoisier discovered oxygen and thus founded the science of Chemistry. In 1779 was set up the first factory in which spinning machinery was worked with mechanical power, the water-wheel. James Watt in 1781-82 devised the first practicable steam-engine, which he was enabled to do by the researches of Black a quarter of a century before on latent heat. Watt's invention marks the start of the industrial era. It made possible the improvement of heavy machinery and of metal-work, which in their turn rendered improvements in the steam-engine easier. Steam-power supplanted power in the textile trade and rendered possible great factories and the congregation of workmen in

industrial centres. By 1840 the life of the people of England was greatly changed. Other countries were following closely. Commerce developed correspondingly.

17. The year 1776, just before mechanization and the factory system got into sway, was notable for Adam Smith's book "The Wealth of Nations." He opened out new visions, and founded the science of political economy or economics, from which branched out politics and sociology. Adam Smith pointed out that government regulations hindered trade within and out of a country, and that the wealth of nations was promoted by freedom of trade. His thesis fitted in with the desires of those who had lately acquired power and wealth and of these who had such ambitions. His followers soon clamoured for the removal of all restrictions on trade as well as on industry, and *Laissez Faire* became the established doctrine.

18. Industry lagged behind science. The last quarter of the XVIII century and the first quarter of the XIX had seen the beginnings and rapid progress of several new sciences. In 1800 Volta invented the electric cell. The principles of voltaic electricity and its relation to magnetism were not for some time applied to industry. As time went on there came a tremendous acceleration. The old discoveries of science were applied to industry and new ones were more and more quickly put into use. In the eighties the dynamo and the motor, which had been invented half a century before, were considerably improved and turned to industrial purposes. Thus began the Age of Electricity. The electro-magnetic telegraph was patented in 1837, and by the middle of the century the new means of communication was firmly established. The first telephone was invented by Gaham Bell in 1876 and it was not long before it became a business as well as a socia necessity. In the same year Lawson improved the

bicycle to its present form. The pneumatic tyre came in 1889 and other improvements soon after. Kerosene oil, produced from crude petroleum, became a popular illuminant, and a large quantity of petrol, a volatile spirit, became available as a by-product. In 1876, a remarkable year, the Otto silent gas-engine was made available. From this evolved the diesel engine and the petrol engine, and soon motor-boats, motor-cycles and motor-cars were put on the market. An aeroplane with a petrol engine and an air-screw was invented in 1903 by Wilbur and Orville Wright. In the meanwhile wireless telegraphy was invented by Marconi in 1903, following Hertz's discovery of radio-waves, predicted by Maxwell in the sixties.

19. The last century was remarkable also for the works of Pasteur, the founder of Biochemistry, and of Darwin in the field of Zoology. Medicine and surgery made great strides with the invention of anaesthetics, antiseptics and aseptics. Archaeology and Anthropology were not lagging behind. Mathematics also forged ahead. It may be said that the century was one of tremendous scientific advance and of the application of science to the production of material goods. In the social sphere there were repercussions ; unemployment, exploitation, over-crowding and misery ; the shifting of wealth into the hands of a new type of persons ; the greater hustle and bustle of life ; new types of luxury ; new needs ; new standards of life—all these had their influence on man's outlook on life. These would also account for the impatience with philosophy that grew up. Even in psychology the useful and the immediately applicable were to be pursued.

20. The present century is remarkable for great strides in all the sciences and in the making of instruments of extreme precision, as well as for the myriad applications of scientific discoveries. No sooner is a thing thought of than some one attempts to put it to use. Research is encouraged by industrial and

commercial concerns. Our age is also marked by two world upheavels. These were responsible for frantic investigations into Nature and attempts at the immediate application of the results achieved. Great improvements in air, land and water transport; in telegraphy, telephony, wireless and television, and in innumerable ways of using radio-waves; in medicine and surgery; in agriculture and live-stock farming; in metallurgy, mining and machinery—all these were largely due to war-efforts. Most noteworthy the invention of Radar and progress in Atomic research, so forcibly brought out in the shape of the Atomic Bomb.

21. We have said that philosophy, and in particular psychology are greatly affected by the movements of the sciences and by the general outlook on life. So long as these studies used to be the luxury of thinking men, to be discussed and appreciated in limited coteries, they had little influence on the masses. Gradually, however, that influence began to prevail, partly on account of the changes that took place more and more rapidly in the life of the common man, partly on account of the spread of education aided by facilities of intercourse and of getting information, partly on account of the propagation of philosophical ideas in popular form by great scientists and literary men, partly because the common man is more and more involved in the government of his country, gaining a greater share in the social rule of himself and of his fellows; and partly on account of the subtle propaganda, so easily carried on nowadays, by political parties, but chiefly because there can be no society without a philosophy, no criteria for directing social or even individual behaviour, no individual or social responsibility, no outlook for the individual or for a community. Add to these the forcible presentation, in all its stark grossness, of human misery, brutality and suffering, war and destruction, and we shall see why philosophy has now become the concern of every man.

22. Psychology gradually came into notice when attention had to be paid to systematic methods in education. Now it is found to be essential. It acquired greater and greater importance also in the investigation of abnormal cases, of neurotic afflictions, and of the effects of organic damage suffered by individuals in the wars. It has been applied also to classify men according to their aptitudes so as to get the best of a nation's man-power.

23. It will be observed in the history of thought that whenever a science has effected great and rapid progress or made some startling discovery its leaders unfailingly delve into philosophy. This is due to the urge to harmonize our ideas, to make the new fit in with the old. Consequently there is theorizing. After each advance we seem to have arrived at the ultimate forms of the concrete objects of our study, and an extension of the notions takes us on the verge of philosophy. And because psychology is the link to philosophy the first effects are naturally to be seen there. Thus the development of quantum mechanics led to the theory of indeterminacy and its extension to the mental world. The theory of relativity also had reverberations in the psychological sphere. The discovery of radiation and its properties was hailed as the clue to the origin of life, or to the explanation of thought, just as before that the investigations of Darwin shook philosophy; the synthesis of Urea by Wohler was acclaimed to be the starting point of the explanation of life by physics and chemistry; the great boom in industry led to mechanistic conceptions of life; the great achievements of astronomy and physics and later on of chemistry led to determinism and to the denial of free-will. The rapid advance of mathematics led to idealism. Mathematics itself had influenced Descartes, who was under the spell also of the new physics started by Galileo and the physiology started by Harvey.

24. Whenever people longed more ardently than

before for material welfare, motives of human action were taken as utilitarian or economic. Whenever social unrest was most pronounced, philosophical and psychological theories on Society and its constitution and on the relations of individuals were forthcoming.

25. Thus no science can get away from philosophy. There has never been so much philosophy in the scientific world as there is today in chemistry and physics and biology and in the other sciences. Psychology may be called a 'young' science, inasmuch as its progress on scientific lines has not yet been great, and it displays the activity and enthusiasm of youth. It recently gloried in its escape from philosophy. But so did the other sciences, in their earlier days. They have all become philosophical in their (shall we say?) middle age. There are signs that Psychology is already turning its steps to philosophy. In any case, it is a safe prediction that with greater progress philosophy will again cherish her prodigal child. It cannot be otherwise.

26. Every man has a philosophy. If he professes to have one, his behaviour may or may not be very much in accordance with it. If he does not profess to have any, his behaviour in any case is guided by certain principles of value, of relation to his fellows and to society, of duty, of pleasure, of interests, of political views, and so on; and these principles are the philosophical background to his everyday life. Every child is a philosopher: he constantly enquires why he should do this and not do that, and he discovers many philosophical problems. When the realities of life overshadow these interests, they appear to be unimportant and unconnected with "life". However, they are very real; underlying our everyday actions there is more philosophy than we may imagine or care to admit.

27. Every science touches upon philosophy, and

certainly upon psychology, when it contemplates the foundations upon which it is built, for it at once comes up against the ultimate origin and nature of knowledge itself. Psychology cannot escape philosophy from the very start. The very definition of the subject, the delimitation of its filed of study, the method of approach, the choice of material, the estimation of relative importance of data and of conclusions, these cannot but be philosophical problems. The psychologist who denies having a philosophy has thereby taken up a philosophical stand, which is more precarious than the ones he professes to despise. Psychology has been affected in its outlook and in its methods not only by the sudden rise and development of a physical or natural science but also by the purely speculative philosophy current at different times. The great philosophers, beginning only from Descartes, were primarily psychologists, their tenets being influenced by their conception of the origin and nature of ideas. Psychology was influenced in its turn by Sensism, Positivitism, Subjectivism, Idealism, Materialism, according as each of these had its day. It was affected by mechanistic conceptions, by the notions of physics, of chemistry, of biology, of sociology, of economics, etc. This is because it not only abuts on every other subject of study, but is also concerned directly with the education and happiness of the individual and of society.

CHAPTER X

THE STUDY OF MAN

1. In some of the sciences we have isolation and extension in the manner of analysis and synthesis, or of dissection and reconstruction. There is always the danger that we may easily lose sight of the unity we started with; and, forgetting that abstractions are the work of the mind, lean towards an atomistic view of the world. The significance of the whole as a whole is lost; the wood cannot be seen for the trees. Wholeness is not created by mere aggregation, even by one planned by man; though wholeness is lost by disintegration. The splitting up into parts has isolated these parts from the whole and consequently cut them away from the relations of the whole. The internal dynamics of an object cannot give us its manifestations of reactivity with the world, in which and of which it is, or bring out these real relations in which it, as a whole and a special kind of whole, stands to every other thing separately and to all together. The significance is in the world at large; every object must be studied in its "context". According to atomism each is a self-contained, self-sufficient, self-significant set of energies. The scientists' view, however, has to cover not only the internal but also the external relations of an object, the relations of the internal structure to the external functions, the significance of both parts and whole. This view must be taken of every entity of science. Even in the field of sociology there are atomistic views: Racialism, Nationalism, Communalism, Provincialism, Parochialism, Individualism.

2. If the study of man is to be a science, all that we have said above must be borne in mind, but more particularly the limitations of science. We

have spoken at length on science not only because it is a manifestation of mind and its workings, but also because, knowing the limitations of science we can the more readily understand those of the study of man. Thus by observing one particular trait of man we are apt to ignore all the rest. This is no wild exaggeration, for we have different views of man, *e.g.*, that man is only a material being subject to physical and chemical laws; that he is entirely spirit and there is no reality outside; that he is made up of matter and spirit independent of each other but running somehow parallel; that he is no higher than a brute animal subject to mechanical laws of impulse and reaction, that his actions can be explained in terms of two (or more) opposing tendencies; that his mind is like a box full of ideas which react with each other automatically and by chance; that his feelings, desires and thoughts are distinct operations; that he has distinct "faculties", that the faculties are localized in different parts of the brain; that every act is due to the sexual urge; and so on. All these represent different doctrines. The errors arise from not considering man as a whole and in his "context".

3. Moreover, there are difficulties in the study of man such as are not met with in the study of inanimate beings or even of the lower animals. Man is individuated not only physically and psychologically but also psychologically. The distinction of one man from another is to be had not only in external form and figure and constitution, but also in behaviour, which includes modes of mental reaction. These are conditioned by his associations of thoughts, feelings and desires; and most of the associations are subjective; moreover, he even consciously directs the actions under observation and reacts to the observation itself. Even a child reacts to external observation; and to obtain a relatively isolated system in psychological experiments is by no means an easy task. When studying the individual mind in detail, we do not even know the

content of the system, the associations of thoughts feelings and desires and the inter-play of motives. This is true even if the subject studies himself ; for to be at once observer and observed, one not influencing the other, is not quite possible, although the advantage of introspection is that the mental content and processes can be recalled and examined.

4. When a group of children are under observation and unaware of it, each is less influenced by it. If they are conscious of the observation, the general mode of behaviour will have a different trend. Courage, sophistication, etc. may show up mere prominently than in each child separately. And different groups will show different average behaviour, the mode of grouping and the size and structure of the groups being different.

5. Referring again to introspection, you may start with one idea and cut yourself away from external influences, as far as possible placing yourself in as exactly the same circumstances on two separate occasions ; but the trend of thought will never be the same. In mathematical or logical reasoning, perhaps, where feelings and desires are not much in evidence, it may be almost the same. This would show that in the realm of abstract ideas, the mental processes follow a discernable plan, though even here the varying amount of attention and interest leads to a variation in the line of thought.

6. The difficulties in the study of psychology arise also from the nature of its object. It is one that cannot be analysed and then re-synthesized into a whole ; it is an organized complexity, which, if broken up is, as it were, killed. Again the study itself is so mixed up with the passions, with vested interests, fixed beliefs and violent prejudices, and is so bound up with the cultural outlook, that it is apt to arouse strong feelings and bitter disputes. The experimental sciences like physics and chemistry and to some

extent medicine and botany and zoology and the observational sciences like astronomy, anthropology and geology, which apply objective results obtained by repeated experiments in a laboratory, can point out to clear-cut definitions, well-formulated relations predictions and precise quantitative computations; but these fixed sciences do not in general arouse antagonism or devotion. When they do this, as sometimes in connection with a doctrine, it is because they are indirectly or even falsely connected with a Rule of Life. The greatest difficulty in the study of man arises from the element of indeterminacy in his acts, a manifestation of willing.

7. Of late, however, psychology has courted mathematics in the shape of Intelligence Tests and has adopted some of the methods of the laboratory, allying itself with physics, chemistry and physiology in an effort to become a science with objective results. It cannot, however, get away from consciousness; it cannot ignore that something called Life; it cannot shut its eyes to Purpose and Aim, not only in the transcendental sense in which these are manifested in the world in general but also in the particular narrow sphere of human activity; it cannot refuse to acknowledge non-quantitative qualities in human actions. If it did, then it would dwindle down to the level of the sciences whose subject-matter is other than man, and not be what it claims to be—psychology.

8. The effort to reduce human behaviour to mechanistic terms makes psychology convertible with physiology and further ignores not only mind but also consciousness and life. The study of intelligence narrows down the field by a fiction, ignoring so many aspects of a human act, including several characteristic ones; though, as an attempt to comprehend by first insolating one aspect out of several, it has its value. Dynamic psychology, dealing in particular with

instincts and emotions and with the unconscious mind, also ignores some fundamental aspects of human behaviour. These are the three main trends of modern psychology, each with a narrow field of its own and with its own methodology. If we are to study the behaviour of man, however, as man, even these three fields and their methods co-ordinated into a united system, do not integrate into a sufficient whole so as to bear the name of psychology.

9. Let us indicate in brief the chief points of difference in grades of being. All concrete things exhibit reactivity. Plants are directive of their reactivity. Animals are directive and conscious of their reactivity. Man is consciously directive of his reactivity. We consider each, of course, in his highest manifestations.

10. The materialistic view was that the behaviour of an individual was governed wholly and solely by material factors and that the laws of operation of these factors could be discovered by ordinary scientific methods in the laboratory. The protagonists of Free-will at one time entirely ingored outside factors and confined their attention only to the subjective so-called Feeling of Freedom. The materialists refused to recognise that the individual in his higher manifestations is himself one and a peculiar one of the causal factors of a situation, directing consciously a flow of energy. The free-willers ignored needs, which are often external or material, as conditioning factors or as restrictions to be overcome by the vital and mental activity.

11. Statistics has been applied to the study of man. Now, the elements of indeterminacy arising in our observations of individuals in any group are: (1) lack of differentiation (which increases as we go down in the scale of being); (2) instability of isolated existence, or a potentiality to modes of existence within a higher

unity (i.e. a tendency to enter into a combination); (3) reaction with the tools and processes of observation; and (4) practical difficulties of dealing with large numbers.

12. Men are, however, the most highly individuated. It sometimes happens that, with insufficient knowledge, we have a difficulty in differentiating between twins, similar in external habits and behaviour. Such a difficulty, fortunately, rarely occurs. It may happen that we sometimes do not wish to differentiate between individuals in a group. When the Chancellor of the Exchequer estimates the income-tax for the next year, it is practically beyond his powers to examine the behaviour of each tax-payer. In fixing the price of a commodity the businessman does not consider the whims of each separate purchaser. Statistical methods have given in general satisfactory results. In such cases "free-will" is not much in evidence, and the actions of a citizen are directed by his already existing associations of thoughts, feelings, desires, resulting from sanctions, from social feelings, from habits, from the force of example, from fashion etc. All the same we may have disturbances like "non-co-operation", "civil disobedience" or "boycotting," upsetting all the chancellor's or the business-man's calculations. Again, the man-power of a nation can be reckoned without taking into account individual differences. (Nevertheless, even in large aggregates differences show themselves; one regiment is more efficient than another, one nation more progressive than another.) For many purposes, therefore, individual differences may be expected to cancel each other in the mass.

13. There is much talk of 'herd-instinct' and the exhibition of 'primitive' tendencies of which the individual, when alone, would be ashamed. This is partly due to the 'force of example.' When a leader acts in a particular manner or urges his followers to a certain course of action, certain social restrictions are

removed. We may remember that society imposes social restrictions on the individual. When the immediate social environment lifts these restrictions, we may expect behaviour to be different. People in general act with little deliberation. There is very little willing in most of our behaviour, because willing involves a strain. The more mechanical our behaviour the more reliable are statistics. However, a single individual may have great qualities and be responsible for the difference between the group to which he belongs and any other group. That group itself may modify the larger one to which it belongs. In a group the individual is encouraged by the sense that social support is at hand and opposition remote or superable. The admiration for the leader is again related to "self-respect", which is the respect of the self for the Ego or idealised self which one hopes to be and to be considered; i.e. for the apprehended self isolated from its defects and with its perfections intensified as in the model set up before it. Also one does not like to be different from the others in the immediate environment; any difference sought for is not of kind but only of degree; one tries to "show off" before the others. Together with the instinct shown by the social animals of follow-the-leader, there is the instinct to be in the van. A quality manifested in common by members of a group is intensified by this competition. "Compensation" for the feeling of inferiority shows itself in this manner. One seeks for admiration, and this varies the behaviour, although fashion must be followed fairly closely so that one may not appear singular or strange. Also sympathy is aroused between the members of a group united by a common purpose or common interests or even misfortunes. Thus, for example, a great deal of fortitude may be evinced by people in spite of a continual aerial blitz.

14. Man reacts notably with the tools and processes of observation. Add to this that the phenomena

have to be interpreted, and by men; and we cannot get away from the subjective element. If, however, passions and prejudices are put aside and the results of observation collated and fairly examined, some degree of objectivity may be attained. Nevertheless, not only must the groups to be examined be large and the number of experiments great, but it is also necessary that the number of observers themselves be so great as to eliminate differences in interpretation. It is no wonder then that Psychology is as yet far from being an exact science!

15. The difficulty of dealing with large numbers is also to be considered. No one likes his inner life to be examined; few will allow themselves to be made objects of experiment; and each one has his own work or interests. We can perhaps experiment with children, but even here the number at the disposal of the experimenter is generally too small to warrant generalizations. To experiment with animals and then extend the results to man is unjustifiable, to say the least. Only a philosophical bias would tolerate such a procedure; but it would beg a question and make the unwarranted assumption that man is no higher than brute animals.

16. Let us now add another to the four elements of indeterminacy recounted above, and that is Willing. If this aspect of a human act be ignored or discounted from *a priori* considerations, there can be no Psychology whatever. If man is studied, it must be in all his manifestations. Willing is a special manifestation of the human form. It is the *conscious directing of reactivities into subordination and co-ordination under a whole and of the whole in its environment.* Man is the highest animal in the evolutionary sense, because he is not only the most adapted but he is also most adaptable to his environment; and this chiefly because he adapts his environment to himself. In this itself willing is so manifest that it is strange how it can

be denied. It is sometimes, however, denied, and by the same perversity that leads to stubbornness, deceitfulness, prejudice, injustice; in short, to all the miseries of man. We do not deny the Unconscious but we affirm that the phenomena of willing are in the Conscious only.

Willing

17. Metaphysically we may speak of the will, but we must not regard it as an isolated independent entity, or as a "faculty" or "force". Willing is in different degrees of evidence in every human act. Indeed, a *human act* is the act of a man *as such*; that in which willing is manifest.

18. Willing is manifest in Attention, Concentration, Active Memory, Imagination; in the Subjective Association of thoughts-feelings-desires; in the overcoming of restrictions; in the setting up of Values, in the pursuit of Ends; in short, in all our consciously directed activities. It is a conscious directing of the movement of unification, or of the Isolation and Extension of the self.

19. Willing is manifested as one aspect of the complex human act. We cannot partition off human acts, marking off some as acts of willing, some as acts of reasoning, some as acts of memory, etc. This would be indulging in fictions. When we speak of the will, it must be understood as the subject himself in regard to the particular aspect of willing in his acts.

20. In man thoughts, feelings, desires are associated, and sometimes the mental process is associated with an external physical one. The association may be a passive one, arising in the first instance from circumstances or undirected reactions to external stimuli. But in man it is often active, i.e. directed by the subject himself.

21. Feeling may follow feeling as a physiological reaction, but the association may be directed by the will. In brute animals the association of feelings and images is **never directed** by the subject itself. This we know only by interpretation of their actions. In any case, one who denies willing in human acts has greater reason to do so in animal acts. I experience willing and I see its external manifestations in other men just as I see it in myself, but I fail to see it in members of the lower kingdoms. Our lower feelings are conditioned by strong biological movements; with the higher ones thought is more prominently associated. In these associations willing may be manifested. Pride is a feeling particularly human. Neurosis is a functional derangement due to disorders in the nervous system affecting the mind; in particular, as a reaction to the want of unity of the whole mental content and especially to the want of co-ordination between thinking and feeling. It is due to weakness in mental direction. Animals do not suffer from neurosis; at least, not in the sense that man does.

22. Dr. Levy admits that purposive consciousness is distinctive of human beings; though for him it is a quality evolved from lower levels of being. He says: "Conscious purposive bahaviour involves, as we all know from personal experience, bringing together a whole mass of diverse considerations and experiences, that were previously separate and distinct..... The very act of seeing each fact and each experience in association with or in the environment of each of the others and of all the others is to bring at that very moment new group qualities into consciousness. In this sense also, it would appear, is conscious purposive behaviour a quality of a higher and more complex level than the simple activity of inanimate matter." Here Dr. Levy seems to think that *conscious purposive behaviour* is a group-quality evolving from the grouping of ideas. He does not see purposiveness in the very grouping or rather in the train itself of ideas

brought up, in their mode of association. The purposiveness is involved in the formation of the train; it is not an effect of it. Also willing is as much manifest in a child of seven as in a savant of seventy, however much more innumerable his ideas or the complexity of his groups. Moreover, Dr. Levy forgets that the whole group is never in consciousness together; so that there can be no question of "group-quality".

23. There are many modes of willing: directing the attention, the imagination, the memory, the mental activities of analysis and synthesis, the association of ideas, of ideas—feelings—desires and of internal aud external operations. When there is no willing, associations are conditioned by circumstances independent of the subject and by physiological reactions. Hence such associations may be called 'objective' or 'passive'.

24. It is remarkable that while thoughts and feelings are only in the present, the will refers to the future. (By a happy coincidence the word *will* in English is used in the formation of the future tense.) There is a present valuation of a future state. There is no 'leap across time'. The valuation is by present associations of thoughts—feelings—desires; the directing is according to present estimates of future needs; the future is envisaged in the present, and, we may also add, through the past, i.e., through the already existing mental content. The future, of course, cannot be as such in consciousness. It is an isolation and has its use. It is a subjective idea; but it is objective also in virtue of the objective facts involved in the estimate. The future is involved in the present inasmuch as causal influences, including the individual himself, are at work *now*.

25. The mind is highly selective, and at any one instant a single thought is in consciousness, i.e., is

attended to. They come up in chains with their emotive and appetitive associations. Our sense organs are selective, but in a passive way. The mind is selective in both a passive as well as an active way.

26. We form habits in thinking, and a chain tends to become regular and to gain in the strength of the linkage. Our mental processes seem to get a momentum of their own, and willing becomes less and less evident. This is good in a way, for willing involves a strain, and habitual ways of thinking save one a great deal of wear and tear. Thus with practice in mathematical and scientific reasoning, such modes of thought finally become almost effortless; they become habits. One can have the 'habit of study' or a 'mathematical' or a 'scientific' or an 'inventive mind'. It is for this reason that, as we have said above, willing is as much evident in a child of seven as in a savant of seventy.

27. It is not so much the actual chain of thoughts, but the mode of linkage that becomes habitual. The more habitual an act the less volition is there in it. The act, therefore, is indirectly voluntary inasmuch as initially in the course of formation of the habit there was some volition. (We shall refer to this point again when we speak about Responsibility.)

28. In the 'conditioned reflex,' e.g., when a soldier mechanically springs up to attention at the ringing call of "Shun!", the act of willing is least in evidence. So also when men act mechanically according to ready-made associations of thoughts—feelings—desires—external actions. What is purposive behaviour initially may become mechanical later on. In such cases the statistical study of men leads to very consistent results. More or less fixed modes of association can be made by education, training, propaganda, etc. It is on mechanised behaviour that

laws are based. There are many influences making for uniform behaviour or for negligibility of variations. Economic 'laws' of buying and selling can be fairly well established. But all such 'laws' can be easily upset, as is too often experienced. If 'independent' thinking is well developed in every citizen of a nation, the leaders will lose their power to lead, unless they are outstanding figures reasonably recognized by each citizen independently as men of worth and character.

29. One principle of Propaganda is that anybody will believe anything if it is repeated often enough. Because most people avoid the strain of willing and permit their associations to be directed for them by others, propaganda is so successful. Even a scientific theory, if repeated often enough, becomes a 'fiction', i.e., held as if it were a factual law. (Conventional expressions also involve fictions, e.g., when I say: *the idea came to my mind* ..... or *my mind was full of ideas*.) The second principle of propaganda is that the bigger a lie the more likely is it to be swallowed. This is because small lies are looked upon as if they were of small consequence and easily verifiable; and so to be accepted at leisure; whereas a big one is to most people unverifiable, but so replete with weighty implications that it must be accepted without delay. Also people seem to believe that no one is capable of such deceitfulness as is implied by the big lie. These principles are at the root of all superstition. Propaganda is one method of obtaining uniformity in human acts.

30. When people are trained to think and act in set ways, they are said to be disciplined. Conscious thought flows on automatically and, as it were, of its own momentum by ready-made associations, and we are complacent in the unity of the mental content and in the social environment. Mental discipline is never so strong, however, that it cannot be broken. A child

may manifest more volition before or in the early stages of his discipline than a full-blooded Nazi.

31. Even a lie, repeated often enough, comes to be believed by the person himself, because it gradually fits into his flow of thought and no longer offers an obstacle to it. This is the genesis of *Delusion*. The demagogue and the propaganda official strives also to associate thoughts with feelings and even with actions, e.g., salutations. He tries to replace sympathy by indignation or vice-versa, or to bring them together. He "plays upon" pride, greed, envy, etc.

32. In animals we recognize a directing of external behaviour only; in ourselves we often experience a conscious directing of both our external and internal actions. That animals are conscious of the directing there is no reason to assume. They do not manifest this to me as my fellow-men do. They only manifest consciousness of their actual sense experiences and movements. Much research work has been done on animals, and it has been established that many important instincts are dependent upon and conditioned by physical stimuli. Thus all the movements of the salmon in migrating and breeding have been shown to be responses to physiological changes connected in particular with its reactions to oxygen; and the maternal instinct in the hen to be connected with the occurrence of local inflammation; that it will sit upon a lump of chalk or scratch a cement floor although grain is plainly scattered over it, does not show any conscious directing of its behaviour. In India cows are 'cheated' into giving milk by the appearance of a stuffed dummy of a calf. Even such actions of an animal as apparently displays "cunning" in its search for prey or in avoiding danger, are all reducible to instincts, automatically directed urges or movements in an animal. That animals are able to change their associations, as in "conditioned responses", or that the animal has something added to

his instinct by learning, does not in the least show any conscious directing of associations; rather, experiments demonstrate that these are made for them by external circumstances only, e.g., the circumstances brought about by the experimenter, or by the adult animal in training its young.

33. Besides Descartes there were several thinkers who considered a brute animal as a mere machine, by contrast with man. ("Machines" however, do not manifest anger, fear, lust, hunger, affection, etc.) Nevertheless, there is a great deal of determinism in the study of brute animals, but nothing like it in that of man.

CHAPTER XI

REACTIVITY IN MAN. REALISM

1. We are living in a changing world. This fact is so patent that it needs no stressing. We find change as the manifestation of the **reactivity** of things. We find one thing acting on another and acted on by something else. Everything exhibits reactivity, and we find nothing in our experience that does not act on or is not acted upon by everything else. Detailed investigation only emphasizes the fact. Nothing is static; nothing is absolutely unchanged.

2. The whole world is a set of units, and each unit is also a set of units, and so on; but this does not go on indefinitely, neither in practice nor even in theory. There are 'ultimate' constituents. An unity is found to be either an intrinsic one or an extrinsic one. An extrinsic unity is one of association, or apposition, or aggregation, or assemblage; an intrinsic unity is one of subordination, co-ordination, and structure of energies into a whole by an intrinsic supreme

or substantial form. Between one set of units and another there is reactivity, as also between the units of a set. The external activity of a thing that has an internal unity is in virtue of this unity and of its external real relations to other things. It acts as a whole.

3. The reactivity is not only of the nature of mere movement, of jostling each other, but also of the type characterised by the phrase *Give and Get.* In the physical sciences the phenomena are of the giving and getting of some sort of physical energy, in addition to the mere display of energy measurable in terms of space and time (Dynamics). In the natural sciences the energy manifested is of a higher order. In biology it is vital energy; in zoology (Animal Biology) it is sense energy; in psychology it is mental energy. In all these sciences we find reactions of the give and get type.

4. However, in higher life the getting takes on a more and more active aspect. It is often also a **taking**; and this active aspect is in virtue of the Supreme Form by which the living thing is distinguished from inanimate substances. The getting is directed by the Finality of the living thing, to which its organization is ordered, and becomes taking. There is also a seeking for contact, which is the condition necessary for getting or taking. In man this directing is very patent: in his search for knowledge, in his treatment of lower things, in his dealings with his own kind. In the very lowest of animal life consciousness is not much in evidence; in the lowest of plant life the directing of the taking is very obscure; in inanimate beings there is no taking but only getting—contacts are not brought about by them. Taking is an active overcoming of isolations, a complex activity over and above the passive behaviour of getting. It is directed to extension of the unity of the subject. In the same way giving has also a more and more active aspect as we ascend the scale of being. It is directed to

isolation, the consolidation of the internal unity by discarding unco-ordinated energy. There is also a giving of a peculiar kind—the giving of ideal being : significance and value. But the highest form of giving is sacrifice, where there is full deliberation. "There is no greater love than this, that a man give his life for his friends."

5. There is but one tendency and that is to unification. This unification is a dynamic one of equilibrium of united energies, with an order and a plan and a finality of its own. The tendency is manifested in different ways. With regard to Extension, there is an entering into a higher unity, without breaking up that of the individual itself ; or an absorption of energy received passively from without into its own set of energies, under its substantial form ; or an active seeking for contact and a striving to take energy into itself. With regard to Isolation, by which is strengthened an internal unity even at the expense of a higher one, there may be an active avoiding of contacts to preserve the individual's own unity, or a rejection of some energy as excessive or not subordinated into its own organization under its substantial form, or an ejection of "waste" matter.

6. Opposites in nature are of the type *is* and *is not*, or *have* and *have not*. In operations they are of the type *give* and *get ;* so that the potentialities are *able-to-give* and *able-to-get*. Giving and getting are logically opposed and objectively coalesce as one. There is a real distinction between giver and getter, and giving and getting are actions oppositely directed. But there is a two-fold unification : the system is unified in the object and in the correlation and complementary nature of the actions; and in the dual system there is but one transaction. There is no giving without a getting and *vice-versa*, and the object or thing given and got is one and the same. The subjects of the actions and the actions them-

selves are distinct, but they are unified by reference to the common object into an ordered interacting system. Prior to the reaction the entities are unified by bonds of relationship, *able-to-give-to*, *able-to-get-from*, both of course referring to the same object given and got and to the same transaction. In the one there is a deficiency, in the other an efficiency. In objects of experience we find a potentiality to a higher state, but also a limit placed to the states to which a substance can actually develop, just as there is a limit at the lower end also. Man cannot rise to a higher substantial state. However, even in accidental changes actions show a potentiality in things, man included. Not only getting shows a potentiality to a state of greater energy, but giving also exhibits a potentiality; for every giver within our experience loses the thing given. It is only in the higher manifestations of human nature that there does not appear to be a loss, e.g., in giving value and significance. These are ideal forms superimposed on a set of energy-objects unifying them in an ideal order. However, our efforts to impart knowledge (which we thereby do not lose), e.g., speech or writing, result is a loss of biological energy; also in the physical superimposing of an order, e.g., in manufacturing an article, energy (e.g., muscular) is used. A human being is a composite of Matter and Form substantially united, and as such is in potentiality at least to accidental states. As a receiver of knowledge he is in potentiality to a state of greater psychic activity.

7. We consider the reactivity of give-get on the highest plane to be characteristic of man, e.g., in the manifestations of apprehension, abstraction, reasoning; of learning, ordering; of intercourse, co-operation, etc., in short, in his human behaviour. By give-get he apprehends external objects and he gives to them a finality by his ordering of them and of their external actions. In scientific practice, he isolates or takes away a thing from an environment and he extends or gives it a new environment. He gives a superficial

unity of association to a set of things in such a manner as to condition the contact of the members of the set, and prevent contact with things external to the set. He *analyses* by conditioning the stability of the substantial unity of a thing; and he *synthesizes* by conditioning the advent of a new substantial unity. In his practical life he seeks for and he avoids; he gives and he gets, in his social life. In the workings of his mind he isolates a concept, bringing it into the 'focus' of consciousness; he extends it by giving it an environment of concepts (or of feelings or of desires). He analyses a concept into 'simpler' isolates, and he synthesizes isolates into a complex concept or notion. He forms an isolated system of concepts, giving it a unity of 'association' by which they are brought into contact with each other. He forms associations of feelings and desires and external actions with mental images. He understands by recognising relations of giving and getting or of part and whole between his concepts. In short, man strives to strengthen his unity and to extend it even in his mental plane.

8. Unity is the manifestation of a Finis. In a substance the unity is inherent, real and "substantial", and is objectively apprehended by the mind of man. In a plan set up by man, the unity is superficial, ideal and accidental, including significance and value. It is apprehended by the mind of a man only by reference to his own planning.

9. Apprehension is a mental unification of the self and the external world. The contact is in the first instance on the sense-organs, and through 'sensation' with the 'mind'. Real significance and real value in entities are causative of the significance and value apprehended by the mind. They are apprehended in reference to the self, to which the entity is referred directly or indirectly, and so they take on a subjective element. Science is the intellectual unification of the objective world as existing in the

mind. Comprehension is the giving of a unity to the whole intellectual content, or the placing in particular of an object of thought in order in and therefore with respect to all of its relations with every other object of thought. By comprehension, real finality, inherent in the object and independent of the subject, is apprehended. Art is the practical imposition of unity in a scheme, the giving of order and finality with significance and value by the subject.

10. The word 'apprehend' is itself taken from the Latin for 'to get hold of,' and 'perceive' and 'conceive' come also from a Latin root meaning 'to take.' Percepts are the product of apprehension; Concepts and Notions are the products of comprehension. In its fullest sense comprehension is not possible, but in a small way some unity within a set of concepts is obtained. The Intelligibility of an object is not only its apprehensibility, but also its comprehensibility. In fact, even in the simplest apprehension there is some comprehension; for nothing is apprehended without being put into some relation with something else. A union of the self with the external world by all the 'faculties' of thinking, feeling and acting, is Communion.

11. Although actually there may be contact between any two bodies (we are told that an electron occupies the whole of space, although its nucleus is almost a geometrical point), yet we find in individuation evidence of sufficient isolation. In experiments **for a particular purpose on hand**, we can in general often sufficiently isolate a body from the rest of the world. Again, we form an isolated system of bodies in order to allow sufficient contact within the system and insufficient contact of the system with its environment. The 'all-or-nothing' principle of biology, which states that if contact is below a certain minimum there is no reaction, the Quantum Theory, and the discreteness or discontinuity in Nature

(continuity was only a fictitious mental extension) confirm us when we say that give-get reactions occur only when the contact is sufficient. This holds even for reactions between external things and the self, as well as for reactions in the internal content of the mind, in which such contacts are passively and actively controlled.

12. The concrete sciences are, no doubt, concerned with behaviour, but they describe the behaviour of objects ; they do not deal with mere abstractions, nor do we translate actual experience into scientific language in any way we like. In fact, there is a pitfall connected with our process of abstraction, viz. that of conceiving the thing itself as wholly represented by an abstraction. When we have a notion of a thing, this ought to be sufficient for the purpose in hand—otherwise there is Error. Error is then a notion insufficiently representative of an object for a particular purpose but taken as if it were sufficiently representative of it. The root of error is Abstraction. It is not necessary, nor is it possible, to view an object in all its aspects every time we deal with it in thought. But the limitations of abstraction and of our ways of thinking must be borne in mind.

13. The 'laws' discovered by us in science are statements of relations of potential reactivity between entitites. In the human sciences also we attempt to enunciate laws, but such as we have are not of the same type as those of the 'exact' sciences. The quality of freedom in the higher acts of man upsets all of them. However, the various factors influencing the individual or the social will can certainly be studied with profit. It seems to us as if in this respect practice (e.g. in Totalitarian States) has far outstripped theory.

14. The objective laws of the exact sciences **pertain to the very nature of things.** It is in the shape

of laws that we grasp the relations that go to make significance. Laws are statements not only of modes of observed behaviour, but also of tendencies; else they will be of no use in prediction. A law is not only a resume of past experiences, but also an anticipation of future ones. It enjoys an ideal permanence, derived from the permanence of the natures of things. It has more than a mnemonic value, and its criterion of validity is not simplicity or logical harmony; nor will scientists allow personal or racial prejudices to weigh in the matter. Indeed, it is logical harmony that has to be sought for among the laws; and we do not improvise laws for the sake of harmony. Any statement giving a reason for a law or putting it into harmony with others is a Theory. Hypothesis is the assumption of the real existence of an entity which does not directly manifest itself. We strive to perceive its manifestations in order to verify the hypothesis, which otherwise would only serve the purpose of a Theory. We study behaviour, no doubt, but the behaviour is of **something.**

15. External reality affects the mind in the manner conditioned by both. It may be said that it exists in the mind; but certainly not as it is in itself. This is impossible—it would not be what it is, nor would the mind be what it is. Mind, we may remind ourselves, is a particular mode of behaviour of man. Man in a particular aspect of his behaviour we abstractively call mind. We cannot prove a realism-that things really exist outside the mind and can affect the mind. That they do affect the mind, and that they are not, or not wholly, creations of the mind, is itself experience. Laws and concepts are not purely mental fabrications. In theory, there may be Subjectivists and Solipsists, but in practice there is none. Schopenhauer, the keystone of whose teaching was the negation of life, detested any conversation about Death. Famous Solipsists have shuddered at pain. Even Bishop Berkeley postulated

a God as a real external entity in order to give himself an existence in his mind. Solipsism is a false isolation, the divorce of the individual from his context. To the Solipsist his senses and his feelings are his only reality; all the rest creatures of his imagination, 'figments of his brain.' He appeals to Logic as the test of truth. The Solipsist's vigorous attempt to convince another of his doctrine is itself illogical behaviour. He uses language and illustrations from common speech and experience; "words that have no meaning except on the assumption that they exist both for him and the rest of society." He does not enquire about the test of his logic, which is Objectivity. He is such an argumentative fellow because he cannot even convince himself; he is presenting himself with a subjective 'lie' which he cannot himself swallow; there is a disordination in his mental content.

16. It must be admitted that Solipsism can logically hold: all things may be a dream. Perhaps it is the simplest theory. But a theory is meant not only to satisfy the mind in the easiest way, but also first and foremost to cover facts. If the basic fact is shelved, then all facts are thereby shelved also. I find that I have to fit myself into the world and that the world will not fit itself into me. And not all my dreaming will fabricate a world of harmony within me.

17. We cannot prove facts. We apprehend them as such. The guarantee that they are not mental fictions is their objectivity. I cannot prove that I am looking at this sheet of paper and writing on it. Nor can I prove that I exist, in spite of the Cartesian slogan. Reality is the primordial datum of experience. I cannot even prove that another mind as such exists, except by analogy; but the evidence is so subjectively convincing that I accept it without grudge. I infer a reason and a will just like mine. Communication between minds is by external symbols. Also knowledge 'grows' with experience, and all my visions are grounded on it.

18. We should therefore take Realism for granted, and a Realative Realism as most suasive. By this I mean the acknowledgment of reality independent of the mind of any individual and of all human beings. We have no reason for an Absolute Realism, as if the world were independent altogether of mind. Indeed, the Intelligibility of the world is taken by many to be an indication of its dependence on a mind similar to but by far transcending the human mind, inasmuch at least as the world, of which the human mind is a part, far transcends it.

19. To acknowledge the objectivity of knowledge is to acknowledge that the external world is the cause of the mental world. If Realism is not granted—at least a Relative Realism—no further discussion is of any value.

20. One may bring forward some recent experiments such as making a blind person 'see' by a series of electric shocks or mechanical stimuli given to the optic nerve, or the optical centres, by which he may distinguish colours and perhaps forms. This does not, however, prove anything against the objectivity of knowledge or the causal theory of perception. On the other hand it confirms the fact of receptivity from outside and reaction within.

21. The extreme Objectivist places the universe entirely outside himself; the extreme Subjectivist places it entirely within himself. As a matter of fact, the real universe is one within which the individual lies and in which he reacts; and the apprehended universe is the joint-product of the two, when these are differentiated.

22. Consciousness is the experiencing by the whole individual, or the manifestation to the individual himself, of the unifying adjustment which his Substantial Form effects, of the subordination and

co-ordination of parts into a whole. It implies also the experiencing of the distinctions arising from the insubordination, disordination, and lack of unity in a higher whole; of the restrictions to the extension of his own unity outside himself by knowledge understanding and sympathy, and to that within himself. The world overwhelms us by its external pressures. We have sense organs and these are selective. The external pressures are, as it were, sorted out and have their different physiological effects. But the mind is still more selective, i.e., we are not conscious of all the reactions within us at one and the same time. Something more is required, and that is Attention. Attention is the process of selective consciousness, by which one of several reactions is consciously experienced. This selectivity is due to several factors. The nature of the sense-impression and the strength of it determine to some extent the attention. When it is wholly directed by such material conditions, it is Physiological Selectivity. If it is directed also consciously by the mind, then it is also mental. Attention brings a sense-species with its intelligible-species into the centre ('focus') of consciousness; that is to say, it is itself the process of experiencing one species in preference to another. Thus I may 'strain' my ears to hear something, or my eyes to see something. Without mental Attention, there can be no mental planning whatever.

23. By our selective organs, external energy is received by them of kinds and in ways determined by them. The reception is accidental and superficial, and the energy received is raised to a higher plane and given the form of sense-species. This is further sublimated or raised to the human plane, becoming intelligible-species. The intelligible-species is absorbed into the being of the individual as a percept. Is it out of the way to suggest that the human individual with his superior Substancial Form gives a higher mode of being to material energies? Do we not have

an analogous uplift in photo-synthesis and in metabolism, by which food is brought to the level of the living thing before it is absorbed? So also may material energies be brought to the level of an animal before it is absorbed as a sense-image, and further to the level of man before it is absorbed as an intelligible-species.

24. The sense-species can be in the mind, and with it the intelligible-species. When it is in the mind and is not the direct result of sense-impression, the word image is used for it and the process by which it gets into consciousness is imagination.

25. The key to Nature is Unity. There is a continual process towards dynamic equilibrium, which is a state of unity, with a subordination and co-ordination of parts and a wholeness. While one equilibrium is being established, there is also a change going on which would make the equilibrium not a final one. There is never a final dynamic equilibrium. At least it is not within experience. Consciousness is itself an adjusting of equilibrium. It seems to be as impossible as a dead stasis, a state of absolute want of change. The tendency in Nature is continually towards unification into a whole, and every unification has a plan. That which cannot fit into the plan would upset it, or would demand a more comprehensive plan for its inclusion. We are at present concerned with Mind. Mind is a plan, an organisation of mental processes. This organisation is, to some extent, at least, dependent on the subject. It is not wholly the result of external influences or impressions : it would be a jumble. No new mental process fits in automatically with the mental content ; it needs to be, as it were, to use a familiar term, assimilated.

26. Feeling is the mode of consciousness of an internal movement or tendency or urge to change to or from an equilibrium. It may be wholly

physiological, as experienced by all animals. In man feeling extends to the mental content. Interest is the feeling accompanying Attention. Dissatisfaction is a primary feeling when it is associated with a disordination, owing to something in consciousness not fitting into the mental plan; it is connected with Aversion. When the disordination is due to something wanting in the vital plan, it is connected with Desire. Desire is the urge for unification by extension; Aversion is the urge for unification by isolation. Satisfaction is the feeling of the process of union. A Need is a lack of being: we are not conscious of the thing needed; we infer it. But we are, in a way, conscious of the insubordination and disordination within ourselves, of our isolations and extensions. In this way needs are "felt." Indisposition is the counterpart of dissatisfaction in the physiological plane. Pain is a primary feeling associated with a disordination in the physiological make-up. Pleasure is the primary feeling of the process of vital union. Dissatisfaction in the higher activities of the human mind, *e.g.*, by a disunion in the intellectual content, goes by the name of Perplexity. The opposite feeling may be called Complacence.

27. It must be stated that these feelings are also associated with Attention. The attention may be physiological, according to the strength of the accompanying physiological process; or it may be, in addition, mental, according to the mental effort of directing the feeling in consciousness. Every feeling also may have a mental image. Thus an image may be very complex, representing a sensation, a feeling and a thought. These may be connected by circumstances in the first instances, but in the image they may also be associated by the mind itself. In brute animals the association of image and feeling and action is not consciously directed by the subject itself, as it can be in man. We know this because we ourselves do not always consciously direct our thought

processes and our actions, and because we have no reason to say that animals act with deliberation.

28. A feeling with a violent physiological reaction may be called an Emotion. When an emotion is connected with Desire or Aversion, it may be called Passion.

29. An emotion, being a physiological movement, directed—like every vital process—towards equilibrium, goes beyond the point of equilibrium and is followed by the opposite emotion, like a sort of oscillation due to the inertia of motion or momentum. Hence a feeling is conditioned also by the preceding feeling. Physiologically there is a displacement or shifting of energy, and the shift is apprehended as a feeling. We are not conscious of what goes on within us but of the changing state or of the urge to it; and this mode of consciousness is feeling. The more we recede from the point of equilibrium the more turbulent is the feeling. The more turbulent the feeling the more difficult is it for one to pay attention to anything else or to consciously subdue it.

30. An equilibrium is itself a planned whole, although a dynamic one. A fresh access of energy will disturb it, unless the disturbing factor is itself brought into the unity or somehow got rid of. In living things foreign matter which cannot be assimilated is either extruded or segregated so as not to interfere with the vital processes. In animals a sense-species not fitting in with the mind-plan is disturbing, and the feeling associated with the disturbance is Perturbation. When the disturbance is great, the feeling becomes Fear.

31. A new sense-image does not fit in at once with the mind-plan. A repetition or a frequent occurrence of it forces it into the plan, which somehow has to adjust itself anew. Thus we accept phenomena by Familiarity with them. This can be

easily seen in the mental progress of a child, or of a savage brought into the ambit of civilization. The feeling associated with Familiarity is itself Satisfaction or Complacence. With regard to the higher mental processes, there is also an acceptance into the mental plan, called Assent. But familiarity is insufficient. When the process fits properly into a plan, then the mind Acquiesces in it, and the feeling is Acquiescence. If it does not so fit in, then every time it is repeated it brings about a Perplexity, which may at times be violent. In man's mental activity the planning characteristic of man, is man's own, i.e., not entirely due to the natural reaction of his physiological being with the external world. It is consciously directed by man himself.

32. Man is a microcosm inasmuch as he partakes of the natures of all things; he belongs to the three Natural Kingdoms and himself makes up the fourth and highest among visible beings. His highest activities are divided up into feelings, desires, thoughts and willings, but these are not airtight partitions. Every human act reflects his whole nature. Our classification is a convenient one made by Abstraction, of which we shall deal later. There in no human feeling or desire without thinking and willing, and with all of it there is a physiological process. Man is not made up of pure spirit and pure matter, whose actions (if conceivable) can be separated. We classify a human act according to its predominant quality.

33. Assent in which there is the union of an idea with an already united set of ideas, is Intellectual Assent (so called, of course, by an Abstraction). In the same way we speak of Moral Assent, when it is more connected with willing. When, however, we take the unityas one of the whole mental content—of thoughts, feelings, desires—then the term to be used is Psychological Assent.

34. The tendency to unification, as we have said, is the key to nature. The individual tends to consolidate his union and to extend it; he tends to be one in himself and one with the world. The oneness is only a planned dynamic equilibrium, and necessarily takes different forms, not one of which is ever perfect. Obviously there are severe limitations to the unification. There is no universal substantial union of all matter under one Substantial Form. The infant manifests the tendency by grasping, by putting into its mouth, by acquiescence in being hugged and kissed. Later on with the greater development of the sense-organs and the exercise of their faculties, the unification is carried on by the reception of sense-impressions, i.e., of external energies impinging upon the subject and absorbed into his psychological being. The sexual urge is also an illustration of this tendency. The social instinct, the herd-instinct, the imitation-instinct, these also show the tendency to unification. Apprehension unifies further the individual with the world. Reasoning achieves the unification of the mind-plan. Contemplation perfects it.

35. There may even be the strengthening of a lower union at the expense of a higher one; a discarding of a disturbing factor, not because the tendency to unification is not there, but because the item is an obstacle to the unifying process. In this way, we understand the feelings of Dissatisfaction, Aversion, Pain, Anger, Strangeness, Perplexity. The world and Man may be explained without recourse to two opposing Forces causing all natural phenomena and raising up the so-called Problem of Evil.

CHAPTER XII

MIND, IMAGINATION, ASSOCIATION. MEMORY.

Mind

1. We have dealt elsewhere with the objectivity of our knowledge and the reality of the world (see *Science, Cause and God*, by the author). Suffice it to say that we do experience the world, and directly through the senses. We distinguish between the Self and the non-Self or external world. We apprehend even the Self as made up of parts. Here it must be noted that if I see a toe, the sight itself does not give me personal experience of it, nor even the feel of it by, say, my fingers; it is the sensation of touch and the muscular and organic sensations *in* the toe that make one experience it as an integral part of myself. Thus I experience the non-Self as well as the Self by the external senses, and the Self more particularly by the organic senses. Reality of other selves and of the rest of the external world, just as of the Self, is experienced. Subjectivism is not so rampant nowadays as it was in the last century.

2. Descartes raised up a problem by assuming that Man was made up of Mind and Matter, which are unable to act on one another, and which exist, as it were, separately. Philosophers racked their brains to show how Matter and Mind worked together as one in a person. Mind, however, is only an aspect of human activity. The sense in which this activity exhibits qualities *above* the qualities shown by the behaviour of inanimate objects and of plants and animals, must be properly understood, as also the manner in which human behaviour is directed, in order to see that the Cartesian difficulty was gratuitously raised.

3. Man is not a pure spirit. He is a being, one in his nature and operations. This point has been recently

stressed by Adler and the Individual Psychologists, and it is chiefly due to their influenee that it is once again being recognised. It has been recognised also by the Gestalt School. The organic unity of the Self and its distinction from the non-Self is a direct experience.

4. The outside world is experienced as material energies acting on the Self and the Self as an organised self-experiencing reacting unit. The experience is described as conscious. The physiological images and their associability contribute to the aspects of experience called Imagination and Memory. While we are directly aware of immediate experiences, a large part of that experience we call knowledge consists of contributions by these retained images in the manner of Imagination and Memory. If we have to speak of "elements" of cognition, they are the physiological images and processes; but **a cognitive act is itself one and simple.** The special qualities in human activity are to be seen in the active direction by the Self of associations and dissociations and in the direct concentration of consciousness ("Attention"); in isolating and extending; in the awareness of planning or of real relations; in planning or putting into relation; in directing external action according to a mental plan. A physiological image is the plan of cerebral activity as the response to sense impressions got from an object. Images are of sense experiences. These may be symbolic sounds or marks associated with other images. Even a relation corresponds to physiological images of some form of speech. Nevertheless, the conscious act must not be identified with the physiological processes, but must be taken as these unified by a supra-physiological energy, with a supra-physiological or psychical quality in the unified process.

5. No experience justifies the Cartesian Dualism. A short time ago I had a conversation with a Professor of Biology. He told me that he conceived of Life as

some form of energy, subtler even than cosmic rays. I agreed with him half-way; but he did not see why I objected to the use of the word "subtle," even though I pointed out that it savoured of a material flavour; and he admitted that life was not physical energy, like mechanical energy, sound, heat, light, radio-waves, and cosmic-rays. He could only conceive of it as energy—"subtle" for distinction. "Mind" was still more "subtle" for him. He was perplexed when I asked him if evolution was a progress in "subtlety."

6. When we said that a single conscious act was simple, not reducible to elementary conscious acts, we did not intend to deny that we may have complexity in the physiological processes or that there may not be a rapid succession of conscious acts. When I hear a dog bark and exclaim that it is Jock barking at a stranger at the gate, I have made a rapid judgment, in which associations with past experiences and relations previously grasped play a part. Even in a mental plan there are elements to be planned. Running through its details, there are in a judgment several conscious acts in succession; viewed as a whole plan, there is but one conscious act. Irrespective of whether animals are capable of judging or not, I know that I am capable of it by thinking, i.e., actively directing my consciousness, and that a judgment is not thrust on me. (If it were, it would be by habit, the judgment having previously being formed by my directive activity.)

7. The psychologist tries to arrive not only at the physiological elements of mental processes, but also at the manner in which mental processes *as such* follow in succession, and how a series of mental processes can yet result in but one mental process, a judgment. We see an edifice not only in its parts, but also as a whole.

8. It is not our intention here to discuss the "education" of the senses. Its importance and significance is sufficiently stressed in manuals of Pedagogy, which also expound methods. Let it suffice to recall our observation that for objectivity a co-ordination of a person's experiences are required and a co-ordination of them with those of others.

9. Our concept of Space-time can only be obtained by a co-ordination of all our external experiences. No concept is given by a single sensation. Analysis and synthesis require a large number of sensations and a variety of them, the recalling of images; Attention and Abstraction, and the perception of relations.

10. Perception is an apprehension of an object as a plan, as a set of internal and external relations. Though the apprehension of relations between external objects is ultimately reducible to that of relations between the subject's experiences, yet the awareness of those relations themselves, as such, is something peculiar to man. When I say: *That is a man*, I have perceived. It is more than the perception spoken of by Gestalt psychologists. It is difficult to distinguish between judgment and preception. We may say that in judgment there are several mental acts as well as one unifying the whole; whereas in perception there is but one mental process which unifies sensations and other associated physiological processes. Extension, figure, number and motion are perceived, apprehended by an active co-ordination of experiences present and past. These are called the *primary qualities* of material objects. St. Thomas, following Aristotle, called them *sensibiles communes*, "common sensibles." Smell, sound, taste, temperature are apprehended, i.e., directly experienced as sensations. Such are called the *secondary qualities* of matter. (St. Thomas, following Aristotle, called them *sensibiles propriae*, "proper sensibles.") St. Thomas

reduced the various forms of common sensibles to Quantity.

Imagination

11. The process of forming mental images, or psychical reactions to sense contact with external objects when these are not present, is called Imagination. The term is also used for the capacity of doing so. An absent object is thus, in a way, present to the subject in its effects. The psychical representation of the object is the Image of it. (It has also been called the Idea of the object; but this word has a variety of meanings, and its choice in place of 'image' is not a happy one.) The physiological process, reproducing the subject's reaction to the object when present, irrespective of any conscious experience of it, may be called a phantasm or physiological image. (The term "image" will sometimes be used in the sequel for "physiological image"; the usage will be clear from the context.)

12. The revived image differs from the immediate experience of the present object. In imagination the image is generally faint and obscure and confused, while in sensation it is clear and distinct; the former is transitory or ephemeral, the latter persists with the contact; the former under one's own control, and vanishes or is replaced by another by direction; the latter is imposed upon us externally. With variation of contact, e.g., by change of relative position of subject and object, the immediate experience is directly altered, whereas the revived image is not so altered, but is, as it were, carried about with us. The image of sensation is directly referred to an external object as caused by it; that of imagination is not, in general, referred to anything external, but, generally speaking, one is conscious of producing it by oneself from within oneself. In imagination the organ directly involved is probably

only the brain or certain cerebral areas; while in sensation it is not only the brain but also the connections right up to the external terminus of sensation-reference.

13. Imagination which proceeds along previously experienced lines in their details and sequences or plan has been called Reproductive Imagination. Reproductive imagination involves more than the revival of mere images. It brings up also judgments previously made and relations formulated and a host of connected experiences. Another name for it is Memory. Memory bears the aspect of Recognition, the feeling of familiarity with the mental processes as having been experienced before. When imagination is directed actively to the representation of objects or the revival of images, in a plan in which they were not previously perceived, it may be called Productive or Creative or Active Imagination. Creative imagination is especially seen in artistic and mechanical constructions; also in 'formal' constructions, as in mathematics. When not directed actively according to any conscious plan, it is Passive Imagination or Phantasy.

14. Reproductive imagination or memory may also be active when the images are actively abstracted and revived from the experiences in which they previously occurred, the series forming a plan, itself derived from actual experience. Thus when I recall my movements this morning I deliberately ignore many experiences I most certainly did have and paid attention to; and I restrict myself only to some of them, for my purpose is to discover where I could possibly have left my glasses. This is Active Memory. Passive memory is not actively directed, at least once it is set going. It may be distinguished from phantasy. Passive memory is determined by sequences and associations previously experienced, the selection being according to a plan

that was once previously in the mind; whereas phantasy proceeds according to no preconceived plan present or past, though, undoubtedly, the images involved in it, when individually considered, are also reproductions of past ones. In Phantasy, however, there is a connectedness, the whole forming a sort of fanciful story. If the details were absolutely unconnected we should remember nothing of them.

15. We must observe that though we have distinguished between Active and Passive Memory and Creative Imagination and Phantasy, we do not speak of a separate "faculty" for each of them. They are names for mental processes in which certain traits are specially notable. Actually one will merge into the other. Memory actively directed may soon become passive; and creative imagination directed according to a plan may soon lapse into phantasy. If we speak of imagination in general itself as a "faculty", it is only because it is physiologically dependent on the whole cerebro-neural system.

Memory and Association

16. The term Memory is commonly used to designate the capacity of retaining, reproducing, and recognising representations of past experiences. Individuals exhibit memory in varying degrees of perfection, and the same individual's memory varies with different experiences. Memory is an essential condition to all knowledge. Acquisition and retention of mental processes are due to physiological properties of one's make-up. The processes can be resuscitated. They may be said to be potentially in the individual, waiting for some impulse to be reproduced. That they can be retained, recalled and recognised as having been experienced in the past, is something to marvel at. Memory differs from imagination inasmuch as in the former the mental processes are referred to the past, or recognised as having been experienced.

17. Aristotle distinguished between Memory (*mne me*) the passive faculty of retention, and reminiscence (*anamnesis*), the power of recall. Modern writers have also distinguished between Spontaneous or Automatic memory, and voluntary memory. The former is common to all animals, the latter is peculiar to man. We shall use the terms Passive Memory and Active Memory instead.

18. Thoughts and recollections that seem to come into the mind spontaneously do not occur altogether at random. In the study of memory introspection is of great use, and we cannot do altogether without it. At times widely remote events succeed one another in imagination. On examination faint and obscure links are found to connect together what looked like a haphazard series of thoughts.

19. In active memory there is an "effort" to recall some past event. In it we see more clearly that the flow of thoughts does not proceed in an errant, lawless manner. When we wish to remember something we do so with a vague notion of it, and this is our starting point. The details lost, i.e. certain associated ideas, are what we seek to recall. We first try to place ourselves in the mental situation of the original event. When we fix the attention on some particular detail that arises in consciousness, it becomes more vivid, and gradually other connected details arise. We seize upon and intensify by attention some newly-awakened recollection that will most likely lead to the end desired. This starts a new series of thoughts related one to the other by Similarity, Contiguity or Contrast, and we again attend to that most likely to lead to the desired result. The process is akin to selecting and ordering means to an end. Each end is a means to a further end. The ultimate end is directive; each means is referred to it. When a subordinate end is attained, a further step between it and the ultimate end is thought out. In this process, however, the relation

between an end and a proximate means to it is not necessarily one of those mentioned above, whereas in each step of active memory it generally is. The end of an effort at remembering is the revival of a past mental process known to be somehow related to the present one, e.g. the name of a person whose photograph is before one.

20 By repeated selection we gradually approach the desired detail of recollection, until it finally rises up, as it were, before the mind and produces a lively feeling of quiescence. The mind is given a setting—*Einstellung*—or incomplete plan into which a detail has to fit. The recollection fits in with the vague outline with which we started, being, as it were, in harmony with it. Pleasure is attached to the psychic unification produced by the achievement, and the relief occasioned by the satisfaction of the undefined want.

21. *Laws of the Association of Ideas or of Mental Suggestion.* Several laws or principles were framed by psychologists according to which recollections succeed one another. The chief laws were :

(1) *The Law of Similarity* or *Affinity.*
(2) *The Law of Contrast* or *Opposition.*
(3) *The Law of Contiguity in space-time.*

22. The Law of Similarity states that *A present state of the mind tends to be succeeded by a state similar to it experienced in the past.* The association is primarily in the mind, though, it must be noted, similarities are in the realities in which the subject perceives them. Similarity has reference to planning and is objective, as we are assured by the fact of science. However, objective similarity alone is no reason why the representation of the past event should succeed the present experience. The similarity should be in the experience of the subject. The association of the states is rendered possible only by the perma-

nence of the subject. A past experience is retained as a physiological impression or habit, and this is resuscitated by a similar present process, the subject recognising the likeness. Examples of association by similarity are abundant.

23. The Law of Contrast states that *A present state of the mind tends to be succeeded by a contrasted state experienced in the past.* This law would seem to contradict the last one, but it must not be considered as a strictly organic law, and it is easily reducible to a combination of the other two laws.

24. The Law of Contiguity states that *A present state of the mind tends to be succeeded by a state experienced in the past which was closely associated in space-time experience with a state similar to the present experienced one.* It is not always possible to distinguish between contiguity in time and contiguity in space. Since, however, we find that the notions should not be rigidly separated, it does not matter. The subjective impressions may occur simultaneously or in close succession, and the objective events may be contiguous in space.

25. The three laws as enunciated above are in the least objectionable form. Several psychologists attempted to reduce the number. The Law of Contrast can be resolved. Firstly, contrast presupposes similarity. *Contraria sunt ejusden generis*: black and white, straight and bent, etc. Nevertheless, this fact is not a sufficient reason why the mind should go from one idea to the opposite rather than to any other allied idea. That it does so is due to *contiguity*. In our experiences and in speech we often come across contrasted terms and objects occurring in pairs of opposites; hence an idea sometimes tends to bring up its opposite.

26. Some have attempted to reduce the Law of

Similarity to that of Contiguity. Others have tried to do the opposite. The German psychologists Maas and Biunde analysed the Law of Similarity in this manner; a face *B* seen now for the first time recalls the face *A*. Let the points common to both be called *M*, and those peculiar to A be called *a*, and those peculiar to B be called *b*. The sight of B draws attention to *M*, and soon *b* is ignored. But since *M* was previously found often in conjunction with *a*, this is brought back to mind, thus recalling *A*. Thus for example, a portrait of Sir Philip Sydney brings up to my mind a picture of Queen Elizabeth, the common element being the ruff about the neck, which brings up other details often seen in the portrait of the queen. J. Ward held that in previous contiguity alone lay the associative or suggestive 'force', while similarity was only an incidental relation recognised after the recollection. Herbert Spencer on the other hand held that similarity was the sole ultimate principle. Association by contiguity is one of partial resemblance between the present and the past mental states. Sir William Hamilton at first, following Maas, formulated one comprehensive principle of association or Law of Redintegration or Totality: *Thoughts suggest each other which have previously constituted parts of the same entire or total act of cognition.* Subsequently Hamilton gave up this position and held that the laws of similarity and contiguity were not reducible one to the other. He then formulated these anew, thus: (1) The law of Repetition or of Direct Remembrance: *Thoughts co-identical in modification* (*i.e. similar as acts of the mind*), *but differing in time, tend to suggest each other*, (2) The law of Redintegration or of Reminiscence or of Indirect Remembrance: *Thoughts once co-identical in time, are, however different as mental modes, again suggestive of each other, and that in the mutual order which they originally held.* The terms *direct* and *indirect* are used to imply that by the former law the mental state is directly recalled; while by the latter the unlike state is mediately brought to mind.

27. Let us now make some observations. Many of the psychologists of the last century considered the mind as a distinct entity, and generally held some sort of parallelistic theory of mind and body. There was also a tendency to hypostatize mental entities. Hence we find expressions like "suggest to the Mind" "the Mind in the presence of an object or event", "the Mind reproduces", etc. Again, in enunciating the law of contiguity they spoke of recalling an object or event, "*formerly* closely connected in space or time with that *now* present"; as if both were together: thus making a contradiction. They also speak of a past state as being the *same* as a present state, though in what way they can be the *same* or *identical* they would have had difficulty in explaining. We must further note that the laws do not refer merely to mental acts abstractly considered as cognitive, but that they include the emotional and volitional aspects as well and also external movements.

28. It is most important to note also an obvious feature of mental processes, to which, I believe, sufficient attention has not been paid. *Every mental act takes time.* We cannot speak of a mental state at a particular instant. Every mental state is dynamic. We cannot reduce it to a zero interval of time. Consequently a whole process has to be considered.

29. Two muscular movements are *similar* when the plans of operation of the cells involved are objectively the same. Again, a muscular movement is learnt by repetition and gets more easily the plan of operation, which is somehow impressed by the experience and fitted in with the rest of the organic structure. The same is true very probably of other cells of the body besides nerve-cells. The basis of similarity, therefore, of two mental processes is the identity in the general plan of operation of the bodily cells involved. Two plans, however, are never absolutely identical in all their details, neither physiologically nor psychically.

Again, although a physiological plan of operation is acquired as a habit by repetition, the habit does not ensure that the process is reproduced altogether identical in all respects with some one or other of the previous processes. Neither is it so with mental processes. Variation is possible and to be expected. I cannot recall my mental processes of the last minute in all their details. Living cells are constantly changing; every movement of a cell changes it; the environment also is constantly changing; the *setting* of an event is changing; my physical relations to my environment are constantly being altered.

30. Every physiological process is a series of oscillations or can be reduced to one. A sensation of touch or of sight is an oscillatory movement in which there is adjustment and readjustment. That is why sensation requires a minimum of time. A sensation is not the act of an instant, but a process in time. That is why also it tends to repetition; and that is why habits can be formed. The process once started, can carry on and repeat, and the repetition may vary, going along the lines of a previous movement, and never altogether along those just experienced.

31. The plans of operation may be objectively alike, partially of course; but we may not be subjectively conscious of the similarity. A great deal depends of course on attention. I look at an irregular cloud. It reminds me of a lion's head; I see many details, the eyes, the ears, the mane, the mouth, etc. As I gaze at it it suddenly takes on the semblance of a man's head—yes, the details are clear. In the short interval the cloud formation has not perceptibility changed. How then did the man's head replace the lion's? The only answer is that I began to pay attention to details; I lost those that contributed to the picture of the lion and picked up those that made up the picture of the man, certain lines of the cloud being common to both the pictures. This is similar to Maas' analysis.

32. The law of contrast and the law of contiguity will both reduce to that of similarity, if it is borne in mind that similarity is to be found in a larger process, and that a mental process tends to repeat in the order in which it was originally experienced. A mental process is not reversible. 'Bread' brings up 'butter' in my mind when I am thinking of food; it brings up 'water' when I am thinking of convicts; it brings up 'sweat of the brow' or 'Jesus Christ' when I am thinking of certain portions of scripture. The *setting* of the present experience or the present underlying mental attitude is noteworthy. 'Bread' in, as it were, different contexts brings up different associations. The mental attitude or context is not clearly in consciousness; it comes up, however, readily when attended to.

33. Let us now consider the laws of similarity and contiguity as recording observed facts: (1) A present mental state tends to be succeeded by a representation of a past state similar to it; (2) this reproduced state often occurs along with unlike contiguous elements which formerly co-existed with it. The difficulty is in reducing the second fact to the first, for coincidence in space-time is not the same as similarity. This difficulty is removed when we note that the two processes have to be taken as one continuous process. The tendency to repetition, due to the oscillatory nature of a psychical process, and to repetition in the time order of occurrence, is itself the basis of the law of similarity. This tendency to repetition is of a complete process. If a present process is externally caused as in sensation, the oscillatory movement is considerably reduced when the external impulse ceases or is ignored. There is a tendency to repeat, however. As the external influence is no longer acting, the repetition will go on for an appreciable time provided the recent impression has been very strong; otherwise the repetition will rapidly vary and proceed along the lines of a previous experience.

34. The variation depends on physiological changes in the subject and to the changing subject's reactions to the changing environment; on attention, determined by the underlying mental attitude or by that setting of the mind immediately prior to the present experience; and also on the strength of past associations.

35. In Maas' analysis (q.v.) the repetitive process tends to reproduce *M* and along with it *a*, for the repetition is not bound down to repeat B, i.e. *M* with *b*. On account of similarity, therefore, the recollective process is initiated. Let us again consider contrast. The word "black" brings to my mind the sound or word-image "white". This is because the word-image "black" is repeated, and in the repetition brings up "black-white", which was a *single* previous mental process. The similarity is between "black" and "black-white". The variation is "white", and attention is given to it. The process is so rapid that it seems to be instantaneous. I am not conscious of any similarity as such, but of the contrast, the common element being ignored.

36. Associations, not actively directed but occurring, as it were, automatically, the element of similarity not abstracted as such, may be called *immediate*. When the element of similarity is abstracted as such, the association may be called *mediate*. This, for example, occurs in reasoning, where one mental process (represented by a premiss) is succeeded by another which has an element in common with the first, and then by a third in which the common element (the middle term) is excluded. In reasoning there is abstraction, isolation or dissociation of ideas.

37. In association the connecting link is that part of the two processes which goes along the same lines. The continuance of a process on different lines depends on past experiences and on the present changing situation. The contiguous are associated. We observe

once more that it is not merely abstract ideas that are associated but the mental processes considered as wholes. Thus two ideas, viewed as abstract, may be associated by a common feeling. One external action may be associated with another by thought or feeling.

38. Associations are generally of a complex nature. A poem may be recollected partly by auditory associations of rhyme and rhythm, partly by associated ideas, and partly by visual associations of the printed copy. It is difficult to decide whether the recollective processes are simultaneous or rapidly successive. The linkages, however, converge and co-operate to recall the same thing. Associations may also be divergent or conflicting. A word or a phrase previously found often in a different context, may put us off the right track. Such Divergent Associations render it difficult to recollect names and faces. In the presence of such an impasse it is best to put away the subject so that the strength of the false linkage is weakened, and then make a fresh start.

39. When we make an effort to remember a thing and do so, we are satisfied. The feeling of satisfaction accompanies the psychological harmony achieved; all the associations fit into place; the mental plan is complete in its details.

40. Association may be actively directed. I may make a knot in my handkerchief to remind me of something to be done; the sight of the knot is associated with the idea of the action and also with the desire to execute it. So also imagination and memory may be actively directed, the volitional aspect being the overcoming of the difficulties of divergent associations and keeping the associations in harmony with the end in view.

41. Association is possible because dissociation is possible. Two different mental processes can be

associated because each may be dissociated from the common or connecting link.

42. The strength of the linkage or the "force" of association depends on the vividness of the total impression, on its recentness, and on the frequency of repetition. The vividness of an impression depends on the one hand on the physical intensity with which the external impression is made on the subject; and on the other on the attention directed to it by the subject. This is moved by the interest or other feeling with which the impression is received and which is aroused by it. A single event of exceptional novelty or beauty or of great personal consequence may make a lifelong impression.

43. Every impression weakens with time. The most recent is, other things being the same, the most deeply impressed. However, by repetition, especially at short intervals, the impression is made more lasting. Two contiguous events may by repetition be associated together so strongly that the repetition of one of them will inevitably bring the other to mind.

44. Of two associated experiences one may have a greater power of recalling the other than vice-versa. In this way it is easier to say the alphabet forwards than backwards. This would show firstly that order in recollection is according to order in experience, and secondly that of two associated images the first is more convergent to the second than the second to the first. But that the second does bring up at times the first is due to the tendency to repetition of the larger complete process.

45. Cognitions do indeed persist in some form in the subject even when he is not actually conscious of them. Aristotle and the schoolmen spoke of memory as a *thesaurus specierum*—'a treasury of images'. It is clear that we shall land ourselves into difficulties

and be forced to adopt a parallelistic view and speak of a simple soul as subject to 'modifications', if we should say that the images are retained in the Soul. The soul is not a detached spirit, but the informing principle manifesting itself in and through the matter with which it forms one living substance. The process of conservation of the image is certainly organic. The psychical process when an external impression is received, and that when an image is resuscitated, are similar; normally, however, the former is referred immediately to an external cause, and the latter is not. It would be redundant to give reasons to justify the tenet that 'species' or images are somehow retained organically.

46. The most important point in regard to association is the nature of the 'urge' of the associated idea. It used to be conceived as a 'force': the first idea exerts a force of attraction over the second, just as the earth attracts a stone, or a magnet a piece of iron; or in the manner of 'chemical affinities'. Such a doctrine, apparently rather simple, is, however, based on analogy alone and raises insuperable difficulties. No idea exists *as such* except in consciousness and consequently cannot be subject to a 'force' before it comes to mind. Even in its physiological counterpart an idea cannot be compared to a physical entity. Rather may the process of association be called a psycho-physical 'habit', proceeding according to the tendency of repetition along a general plan determined by past actual experiences and conditioned by the present mental setting or attitude, easily modified in its details by present impressions. If we were to use terms like 'force' or 'momentum', we should be making up parables and getting misled by them. No doubt, an 'effort' is involved in hindering an associated idea from coming up; but the term 'effort' is used only by analogy for want of a better. There is a purely physiological movement also involved, and the active checking or modifying of the movement would

require some physiological energy. There is certainly an internal shifting of energies, but the controlling power is not an idea or a set of ideas—it must be attributed to the Self. If energy is used for the control of the internal physiological energies, it can only be of a superior non-physical nature, not resident in any particular integral part of the organism, but biological and pertaining to the whole.

47. Further, we must observe that it is false to say that an idea, or a set of ideas, *causes* another idea. The relation is never one of strict or efficient causality. Nor is it true to say that the physiological process is the 'cause' of the mental process. There is, however, a sense in which this is true: it would be a 'material cause', in the Thomistic sense. But if we should enter into a discussion of the question in terms of *matter* and *form*, we should be misunderstood by most modern psychologists, who are not acquainted with the Scholastic concepts and terminology. There is no reason, however, why they should not accept *final causes* (for 'molive', 'purpose', 'goal', 'aim', 'achievement', are terms commonly used by all) provided a final cause is not endowed with a sort of an attractive force. It may be compared to the outline of a mental plan, *Einstellung*, or setting of the mind.

48. The relation of the premisses of a syllogism to the conclusion is a logical relation, one of meaning or significance. In a simple premiss the relation between the terms is that of part and whole.

49. Associative relations must not be confounded with causal relations, nor associative determination with causal determination. One 'term' or mental process follows another. It may not be said that the second is *caused* by the first. Its occurrence is *conditioned* by a mental habit or a habitual shifting of energies.

50. Sir William Hamilton, following Herbart and

the German Spiritualistic School, considered memory as a property of the Soul alone. A cognition was not a passive impression but a spontaneous activity of the soul exerted on the occasion of an external stimulus, and as a mode of the soul, could not be destroyed, though it could be obscured by subsequent modifications of the soul within its limited sphere of consciousness. The German Spiritualistic School indulged in metaphors and were misled by them, e.g. 'surface of consciousness', 'threshold of consciousness'. An act of perception, according to them, persisted as an act of perception though in a lesser degree of activity; certain higher mental processes characteristic of man were the activities of the soul only. Very few psychologists would accept these views nowadays.

51. Spencer, Bain and others explained Memory in materialistic terms. They explained retention and reproduction, the effect of repetition and the growth of mental habits.

52. The materialistic explanation can easily be accepted for the physiological basis of memory. But when put forward as a complete explanation, it fails. It does not take into account recognition, the conscious identification of similarities. In fact, it ignores consciousness altogether. Nor does it allow for Attention and for the conscious direction of Association, Memory and Imagination, nor for Abstraction and Reasoning.

53. No doubt, when not in consciousness the image cannot be called an *actual* cognition. The image is organically in the subject in the manner of a physiological habit. When this passes into conscious act then only is it an actual cognition. The images form, as it were, a store of potential knowledge.

54. The subject consciously controls and directs his thoughts—comparing, abstracting, relating,

ordering; deliberately recalling past events to mind, etc. This is an everyday experience of everyone.

55. It must be admitted, therefore, that acts of memory in man often show clearly qualities peculiar to man. Very often these qualities are not at all discernible, and in these cases we have acts of automatic or passive memory such as are common also to animals.

56. Excellence of memory is estimated by three properties : facility of acquisition, tenacity of retention, and readiness of reproduction. These qualities vary in different persons, and even in the same person. One person easily acquires facts of knowledge but very quickly forgets them; another is slow to acquire, but what he does acquire is enduring ; another can remember things but cannot recall them quickly at the appropriate moment. Again, some are aided by visual convergent associations, some rather by auditory convergences. Some have an excellent memory for certain types of facts but a poor one for others.

57. Memory Training is an important part of education. During the last half-century several systems were developed, all based on the laws of association. We must here distinguish between Instruction, the storing of the mind with useful information, and Education, the development of the human powers. Many acquisitions are best made by sheer repetition, e.g. the alphabet, nominal definitions, or the meanings of words, the multiplication tables, etc. By such exercise mental habits are formed. Also many problems of the same type in Arithmetic have to be worked out to gain facility by forming habits; for habits save labour and time, and even thinking is laborious and takes time, and moreover, the acquisition is only a means to a further end. Nevertheless, intelligent training is to be aimed at, i.e. by active intellectual and volitional effort along the lines of association.

Thus a multiplication table has to be recognised firstly as a series of additions. So also thinking must accompany the working of sums in Arithmetic. Such considerations have to be made in the science of Education. The teacher must aim to get the child to do things willingly, to arouse his interest, to keep the work in touch with the life of the child, to reduce the monotony of repetition by variation—which also gives an opportunity for reasoning and for habits in reasoning.

58. The conditions of Forgetfulness may now be stated : (1) Past events not connected by Similarity or Contiguity with present mental states cannot be recalled. (2) The tendency of an experience to lapse from memory is in proportion to the feebleness of the impression, to the infrequency of repetition, to the interval of time elapsed, and to the number and vividness of other unconnected intervening mental states. J. S. Mill has given us another formula : When a number of ideas suggest one another by association with such certainty and rapidity as to coalesce together in a group, all the members of the group which remain long without being attended to have a tendency to drop out of consciousness (*Exam.* Ch. XIV). Thus we get the general purport of a paragraph, losing the recollection of the separate words and phrases. Mill's formula only emphasizes the influence on obliviscence of inattention, of lapse of time, and of infrequency of repetition, which are included in the second formula given above ; for inattention due to lack of interest or distraction, also contributes to the feebleness of an impression. What remains fixed are a whole plan of interrelated parts.

59. Great geniuses for memory have been known, whose feats have caused wonder. Ben Jonson, it is reported, could repeat word for word everything he had written and most of what he had said. Scaliger conned the Iliad and the Odyssey in three weeks. Pascal could remember almost anything that once

came to his mind. Macaulay, after a single attentive perusal, could repeat pages of what he read; he discovered by accident that he knew by heart the whole of the "Paradise Lost." Mozart as a boy wrote down the score of an oratorio that he had once heard.

60. We shall have more to say on Association, Imagination and Memory in another chapter. We shall now conclude the present one with an outline of the History of the Association Theory.

61. That the sequence of internal mental processes goes by some sort of association was long recognised by philosphers. Aristotle (B.C. 384-322), expounded and reduced mental association as the necessary condition of memory, to the three general laws of Similarity, Contrast and Contiguity. (See Hamilton, *On Reid.*) St. Thomas of Aquin (1225-1274) in his commentaries developed the doctrine of Aristotle, and deduced the three principles from the inherent tendency of the mind to reproduce representations in the order in which they were originally experienced. This view of St. Thomas is worthy of note by modern psychologists. He made a clear analysis of the three principles of Aristotle and stressed in addition the time-order of recollection. He referred to connections made in previous mental states. Association by Similarity, he said, was due to identity in similar mental processes. (The identity could only be, of course, that of plan.) The Law of Contrast he reduced to the other two laws, and the Law of Contiguity to the Law of Similarity by recognising a partial similarity and overlapping of impressions. Thus St. Thomas formulated two general principles of association, Similarity (called by him identity in nature) and Temporal Contiguity; or, as Hamilton called them, the Laws of Direct and Indirect Remembrance. The principles of association were thus long known and they received attention from the Scholastics.

62. In the XVII century Association came in for peculiar interest. It was propounded not only as a general condition of memory or imagination, but advocated to account for all aspects of mental processes, and particularly to support a Determinism in human thought. That there can be actively directed thinking together with Association was ignored, Hobbes in his writings made some reference to Association, borrowing his ideas from the Schoolmen.

63. Locke, in his *Essay*, in 1685 used the phrase Association of Ideas as the title of a chapter dealing with character, in which, however, he but vaguely refers to the theory. Berkeley in his writings between 1709 and 1713 was the first to put forward mental association as an exhaustive principle in the genesis of knowledge. Hume in his *Essay on Human Nature* (1728) insisted more emphatically on the sufficiency of the principle to explain all aspects of cognition. Since Hume this doctrine gained great ascendency in England. Hartley, however, is considered to be the founder of the Associationist School in England. In his *Observations on Man* (1748) he expounded a theory of mechanical association by neural vibrations. He reduced imagination, memory, judgment, reasoning, emotions and passions, to association of sensations. Later, Tucker applied association to Ethics, and Alison to Aesthetics. Good and evil, beauty and ugliness, approval and remorse were all reduced to pleasant and painful sensations associated in experience with certain actions and objects.

64. On the Continent, Pascal in the middle of the XVII century, and after him Malebranche, drew attention to the influence of association in all mental processes. Condillac, about the same time as Hartley in England, formulated almost the same doctrine.

65. In the XIX century James Mill in his *Analysis of the Phenomena of the Human Mind* (1829)

gave a new impetus to the doctrine of Hume and Hartley. Ideas are merely faint reverberations of past sensations. His Law of Indissoluble Association is that "sensations or ideas, repeatedly occurring together or in close succession and never apart, tend to remain bound together in such an indissoluble or inseparable manner that one necessarily or indissolubly suggests the other." This law, he said, accounts for all our mental processes. By a species of "mental chemistry" contiguous states combine or coalesce so as to generate products utterly unlike the constituent elements. By such means are created even universal illusions, such as the unity of the mind, the necessity of mathematical judgments, the externality of the world, etc.

66. John Stuart Mill pursued the same principles, amplifying them with ingenious illustrations. Dr. Bain allotted to the mind a fund of spontaneous activity, continuously supplied by accumulating superfluous muscular energy. He believed that thus he could remedy the defects in the sensist theory in the matter of the cognitive and volitional aspects of thought. Sully in his *Outlines of Psychology* abandoned the "mental chemistry" explanation and admitted active powers of the mind in Attention, Comparison, and Judgment. Judgment is not, as Bain said, merely a "fact of similarity or dissimilarity" or the capacity of experiencing like or unlike feelings, but the intellectual faculty of cognizing this relation of likeness or unlikeness. Sully, however, cannot harmonize his explanation by "active power" with the fundamental tenet of Sensism, that mind is nothing more than a group or series of feelings; for how such a group or series can have an active power in modifying itself is difficult to see. Herman Ebbinghaus (1850-1909) in 1885 made experimental studies on memory and obliviscence. He discovered that ordinarily we forget forty per cent of our experiences within twenty minutes, and seventy-five per cent by the end of a week. Ebbinghaus's data for

his 'curve of obliviscence' were records of the time taken up for learning a certain lesson and for re-learning it after an interval. He used no introspective data. He interpreted his results according to current association principles. Since his day the trend of associationist theory kept to a mechanistic conception of learning, and Associationists followed in the steps of Sully.

67. Associationism is more than the doctrine that there is some sort of association in mental activity. It held that we can get down to ultimate elements, and that these elements were entities; and it strove to explain again how these elements combined again into a complex mental entity. Thus its principal aims were analysis and synthesis, and it started with the taint of Atomism. Firstly, ideas were considered as entities, and the ultimate elements sought were the innate ideas of Descartes. Later, influenced by Kantism, it accepted mental 'forms' or 'categories' as the association bonds or links in the synthesis. Under Herbart's influence, thoughts were endowed with attractive and repulsive forces, and a dynamical explanation was adopted. Then Associationism, having to give up pure thoughts or ideas as its ultimate elements, and tending more to materialistic conceptions, gave regard to cerebro-neural processes. Sensations became the ultimates, and all experiences and ideas had to be reduced to simple sensations. Still Associationism endowed these ultimates with independent reality, and they were treated on the analogy of the chemical elements, the bonds being now likened to chemical affinities. Under the influence of Biology it turned to reflexes as its ultimates; and still the Atomistic tendency persisted, for even reflexes were treated as entities. In the hands of the psychoanalysts, Associationism adopted instincts as its ultimates.

68. William James had pointed out that the elements or atoms were not given in experience, and

that the need for links arose only from the artificial analysis-synthesis. Yet Associationism persisted even in the experimental schools, and analysis was turned to experience itself, reducing all experiences to simple or unitary experiences. Associationists even sought to bring qualities into the analytico-synthetic scheme, and to find a place for them among the elements. Imageless-thought psychologists began again to speak of thought elements. The weak point remained as always before, the question of links or bonds. Associationists spoke vaguely of association links and of association itself as the link.

69. When the stimulus-response psychology was most in vogue, the Associationists regarded each item of stimulation of the organism coming in from the sense organ as an independent unit. Instead of referring to ultimate components, they spoke now of units: units of stimulation and units of response, and even these were all independent units, the bond between stimulus and response being either provided by nature or by drilling and experience. The Associationists now hold that the sense-organs furnish only raw data and that all knowledge from these data comes from learning and experience or by interpretation. What the sense organs present in an experience is only an agglomeration of separate impressions or responses, devoid of meaning, of objects, of forms, of plans. These are put in by learning, by associating experiences, and by interpretation. The stamping in of successful responses and the stamping out of the unsuccessful ones in the Principle of Trial and Error, would show association and dissociation, the links and breaks being the satisfaction of achievement and the dissatisfaction with failure. Association has extended to feelings and emotions. Inasmuch as these are also conscious experiences, and whatever association there may be in thought-feeling-emotion is wholly in the physiological plane, this extension is justified. For there is no pure thought, no pure feeling, no pure

emotion ; the unity of a psychic process is being more and more recognised, due to the influence of Adler and his School.

70. In order to get over the difficulty of part and whole, which has always been another point of attack by adversaries of Associationism, the Associationists (*e.g.* Thorndike in *The Psychology of Learning*) speak of a major bond within which are minor bonds, the latter being from each part of the situation to each part of the response, so that it would appear as if they did not neglect the consideration of a situation as a whole ; but yet they speak of a part of a situation occurring in a new context, failing to see that a part of a situation isolated from its context is no part of it. Thorndike holds that an animal grasps a whole situation and advances far in the analytic direction; whereas man can proceed much further.

71. Associationism can never rid itself of Atomism for the reason given already. Associationists think they avoid Atomism by the avowal of some 'total bond'; but any total bond is destroyed by the associationist analytical method and none can be put in by any synthesis. The effort made by those who speak of patterns or configurations is unsatisfactory, because the pattern in the mind is always a geometrical or a mechanistic one, and no biological, much less psychical, property can arise from such a pattern; moreover, when the pattern is geometrical it is in the ideal plane—in the mind—and not in the reality. In *Science, Cause, and God*, we have devoted a special chapter to Dr. H. Levy, who has made probably the best effort to explain how the greater comes out of the less. (See Ch. XVII, 2nd Edn.)

72. The Principle of Causality was accepted at least implicitly by the early Associationists. At one time it was relegated to a 'form' of the mind. Later, materialistic tendencies predominating, it came again

to the material plane, and psychologists gave up dynamical conceptions—which had stood on the fence between Idealism and Materialism—and adopted mechanistic ones; later still, they went on to biological conceptions; but the tendency to fictions, *i.e.*, to speak of their ultimates as entities, remained. Lately the fashion was to ignore causality in the philosophical world, and associationists felt relieved—but the feeling of relief was never satisfactory or secure.

73. One may accept association as a fact without being an Associationist. For it is not necessary to think of ultimates, nor to speak of entities.

74. Many systems of developing the memory were developed along Associationist principles. The most famous and most widely advertised is Pelmanism. The methods adopted were generally the formation of mnemonic words, phrases or rhymes. Thus the word Vibgyor formed from the first letters of the names of the seven primary colours of the rainbow brings them back in their right order to my mind. Again, the word Atagecaleovir brings to my mind in order the names of the first six "signs" of the Zodiac. A nursery rhyme helps me to remember the number of days in each month. Thus, words, phrases and sentences help to recall facts to mind in a particular order.

75. A system invented by Robert H. Nutt (see his *How to Develop a Good Memory for Names, Faces and Facts*) has been called by him a Mental Filing System. He stresses the need for connecting some new information with some known fact. He suggests certain numbered Key-words as "hooks" in the filing system. They have to be first vividly pictured in imagination indelibly associated with their numbers, thus, ONE is ALARM CLOCK, TWO is TROUSERS, etc. To commit to Memory a series of ordered objects or facts, each one is associated with the corresponding Key-word. The association is done by

forming vividly in mind a sort of moving picture play in which the Key-word image plays a prominent part, together with the image of the fact or object to be remembered. Exaggeration and novelty help. "The sillier the better.....The more ludicrous, gruesome or farfetched a picture is, the longer it will stay in mind, and the easier it will be to recall it." "The more violent the action, the more attention it will get." Exaggeration and novelty and action arouse Interest.

76. One set of Key-word associations will not interfere with another, for each set is itself connected with a basic idea. "You will never confuse the associations, provided you are thinking of what you are doing and have formed vivid pictures in the first place." [The proviso, I believe, implies Attention, and recognises the relations between the resuscitated ideas and the end in view (the fact or object desired to be recalled) which is vaguely in consciousness, rejecting the unwanted (divergent) associations and accepting the convergent one.] Repetition is doubtlessly important, but it should not be done all at once. "The secret of learning by repetition is to repeat at intervals": "Go slowly." Picture associating (mental filing) also has to be done deliberately, repeating at intervals. What has to be done for the day should be recalled first thing in the morning. The associative lists are for day-to-day recollections, to be impressed just strongly enough to last for a day. "There is no quicker way of dismissing them than to mark the items as accomplished, 'finished business,' and never think of them again." To keep things permanently in memory the Interest in them must be permanent, and will be more or less so on account of the utility or business value of things to remember. Repeat briefly "what you have learned once a day for a week and once a week for a month." Nutt's basic principle is that a person "remembers only what he knows; he knows only what he remembers." Any item must be unified and organized into the mental content, else it is not knowledge.

77. To make our memories serve us intelligently we have to decide on what sort of things we wish to remember and concentrate on developing a memory for these. The first condition is necessary to give a setting to the mind, so that we may not lose by momentary inattention something we should find of value later; the second condition is put in because it is found that training does not develop a general "faculty" of memory but only increases the aptitude to recall the particular sort of mental processes that are practised. A clear and definite idea is required of what sort of things one should make an effort to remember and what one can afford to neglect. Toscanini, the great Italian conductor, knew his scores by heart, as his eyesight was too poor to depend on. The great geniuses of memory were marvellous in that each possessed a selective type of memory. Again, in one person visual images may be more easily reproduced than auditory or tactual images, and the associations made should rely on this property. In general visual memory is strongest; that is why the motion picture method of imagination is advocated.

78. When we employ special devices to retain certain items of knowledge, they rarely escape us; this is because the effort to memorize has been rendered not only intellectual but also volitional.

79. To train a memory for names and faces, a permanent interest and desire to remember them must be cultivated. (The ultimate reason may be, *e.g.* desire for success in business or for popularity.) The chief reason one "forgets" a name is that one never knew it in the first instance, and a face because one did not attend to it. "Get the name right," "rap it in by repetition," "fasten the face in the mind" by giving attention to it, and "anchor the name and face by associations" with known events, at least by "artificial" associations in a mental moving-pict ure These four rules are given by Robert H. Nutt an

should prove of use. They recognise, above all, that association can be directed.

80. After all that has been said above on the succession of thoughts, it is advisable to make briefly a few important remarks.

81. A single image is not a "thought" properly speaking. Consciousness is no doubt limited to a single item. Experience shows that several images can be simultaneously in consciousness; but experience also shows that this is so only when they make up a plan, *i.e.* they are related parts in a common whole. Moreover, mental images leave their "traces" in the organism not so much in a material sense as in the sense of modification of the whole psycho-physical plan of the organism. Attention and Abstraction are correlative; for when consciousness is directed to one part it is withdrawn from the others. The intellectual aspect of a mental process is connected with the plan, in which images are arranged and which link them together into a unitary whole. In the case where images are grouped in a sequence automatically, according to the laws of Association, then there is thinking, when the group is perceived as a whole of related parts under a single plan. When they are grouped also according to associative laws, fictitiously or under an imposed plan, which gives them the unity of a whole of related parts, then also there is thinking. The volitional aspect of thinking lies in the effort to perceive a plan in the one case and in the effort to impose a plan in the other. All thought processes, however varied they be, have this in common, that each has a plan. If the intellectual and volitional aspects of thinking be ignored, then we should be neglecting just those special traits of human processes which we set out to investigate in our study.

CHAPTER XIII

INTELLIGENCE

1. Very few are agreed as to what is to be understood by the term "Intelligence." Of course, it is open to a scientist to make up his own nominal definition and to base his conclusions on it; but it is not open to him to force his conclusions on another who has started from a different point of view. If Intelligence be taken as a quality of human behaviour which distinguishes it from animal behaviour and marks it as peculiarly human, then the behaviour of insects, birds and beasts is thereby excluded at once from an application of the term intelligent. Moreover, the general method of investigation is marked out, for the purpose is to pick out what is common to all animal behaviour and what is peculiar to man. There is, of course, the assumption that man does have peculiar distinctive traits. This assumption is based on experience. Moreover, such an assumption is common in science; otherwise science will not be able to have its distinctive genera and species, nor its chemical elements for that matter.

2. Let us investigate some activities of man, which are very common in man and rarely if ever found among animals. Men can count, and children learn to do so. Most savages can count at least up to ten.

3. There was a famous horse in Germany called Clever Hans. It could give correct answers to questions in Arithmetic, not only additions but more complicated problems; and not only to spoken questions but also to questions written on a card and shown to it. Clever Hans gave the answers by taps of his feet. With one forefoot it indicated the ten's digit, and with the other the unit's digit. This one example, so very singular in thousands of years, was

held by some to prove that intelligence was not the monopoly of man, who was only a more advanced edition of a beast.

4. A committee was appointed to investigate the matter. It was found that Clever Hans gave correct answers even in the absence of the owner; and for a time there was great controversy over the matter. Soon, however, a scientist observed that the horse could give the right answer only if the questioner himself knew it, and was not hidden from the horse, and that otherwise it could not solve the simplest problem. A satisfactory explanation was soon forthcoming. The questioner made unconscious almost imperceptible movements of head and body, marking his relief of tension, when the horse had made the correct number of taps with one of its feet, and to those movements of the questioner the horse responded by stopping the tapping with that foot.

5. A pigeon prefers a pile in which there are four grains of corn to one with three grains; a pile of five grains to one of four. But piles of six and seven grains are indistinguishable to it. Let us take the notion of sensitivity, essential to the user of a chemical balance, which is the least weight that will give a perceptible difference in the position of the beam (or of the pointer). We may say that the sensitivity of the estimative sense of the pigeon is about a sixth of a grain. This is not a case of counting, as some would have it. Relative quantities are estimated only by relative impressions made simultaneously or successively on the sense organs of the animal, *e.g.*, of sight, or smell or sound or touch. A young child's sight sensitivity of size is about one-seventh A bird will abandon its nest if two of its four eggs have been stolen, even though nothing else is disturbed; but it apparently does not worry if only one of the four had been removed. A child will miss one toy out of a lot, even if they are alike. In these cases also it is a case of sense-impressions made by the lot as a whole.

6. The sensitivity of a chemical balance depends on its construction and on the material of which it is made. So also an animal's sense-sensitivity depends on the construction of the organ and the delicacy of its parts. Again, the sensitivity of a balance depends on its load, *e.g.* it may be 1 milligram with a load of a few grams and as gross as 1 centigram with a load of 100 grams. So also does the sense-sensitivity of an animal vary with the quantities it deals with. Also, one day the same object may seem to be heavier than on another day.

7. To distinguish between appreciable differences of quantity or of numbers of objects of the same kind presented together in a lot, is therefore not peculiar to man. It has not been established, however, that animals can count, and that they have any abstract notion of number. Between three grains of corn and three piles of bricks there is some similarity, which we abstract as the number three. It would cause a stir indeed and would necessitate a radical change in our philosophical outlook if experiments were devised to show beyond doubt that animals do have such abstract ideas. There was a chimpanzee in the Whipsnade Zoo that was taught to pick up and hand over a certain number of straws when asked for them. It could go up to five but made mistakes with higher numbers. This fact was made much of by some, who said that primitive people could hardly do better than this. This is another instance of quantity estimation by the sense of touch. When a long straw was bent and doubled in two, the ape seemed to count it as two straws. Certainly primitive savages may be expected to use the same estimative sense and not to do any counting in the strict sense; for abstraction certainly improves with training. However, we have evidence to show that even among the most primitive present-day savages there is a concept of number, though their number-system does not go very far. Beyond ten it is "plenty, plenty." Even in the science of Arithmetic

the extension of the number-system and of the concept of number came gradually and took centuries to reach its present stage. A child develops or rather applies its abstractive powers little by little as its organs get developed, its senses trained, and its experiences and interests and needs widened. The progress of the sciences, and even of Mathematics, depends to a large extent also on social needs and interests.

8. Can animals speak? That they communicate with each other, *i.e.*, give and get information by contact with each other, we have no doubt. But most biologists will agree that they do not speak or converse, or purposively communicate knowledge. They have no words, they form no sentences. They have no "language," which is an artificial convention of sound symbols and combinations of them to represent and to express thoughts. They do not store up knowledge in words and hand over such stores to younger generations.

9. Nor can any species of animal build houses varying from a hovel to a palace, from a summer-house to a skyscraper. They do not co-ordinate their efforts and co-operate to produce something that is over and above an instinctive effort. They do not voluntarily merge into societies with artificial conventions and standards of life and with rules of social conduct that can be modified at the will of its members. They do not dress and have fashions changing from day-to-day. They do not prepare their food in conventional and variable forms. It is related that a cannibal tribe made a complaint before a white magistrate protesting against the innovation of another tribe: they objected to being roasted and eaten; they did not mind being boiled and eaten in the usual way! Animals do not look to the future and provide for it in any manner other than instinctively. They do not delve into the past not only of the individual but also of the world. They do not put together sounds or invent sound-instruments to give what we call "music." They have

no art. They have no science. They do not conspire to produce, exchange and distribute goods. They do not regulate their efforts by a distribution deliberately made and readily modifiable. They do not form social bodies or governments ; they have no politics. They do not investigate the properties of the material things of this world in order to put them to use. They do not use tools, machines, engines. They do not fight with weapons. They have no concept of Truth or Beauty or Goodness, or of Justice or Mercy or Charity, such as man has. They do not study their own reactions. They do not acquire a sense of responsibility over and above what they have by instinct. They do not hide their sexual behaviour or such physical movements as would in man disclose a weakening of directive powers. They do not show that they have thoughts, abstract ideas, judgments, analysis and synthesis, reasoning, contemplation ; that the direction of any of their movements is more than physiological response.

10. These are all negative statements. The positive converses need proof ; otherwise they would be unwarrantable assumptions. Surely man, who can interpret reasoning behaviour, analyse minutely and synthesize, will be able to recognise such behaviour in an animal. Surely also domestic animals, which have been man's servants and companions for thousands and thousands of years, almost from the start of the race, would have shown some progress in intelligent behaviour by contact with man ; whereas a human infant in a very few years manifests intelligence. Domestic animals do not yet seem to be aware that they are bred for the purposes of man, and mainly for slaughter. Proofs of intelligence must be the evidence of a large number of experiments with only one plausible interpretation ; not solitary instances of Sally the Chimpanzee or Clever Hans the counting horse.

11. The simplest kind of learning is muscular learning. This is got by exercise or practice. Animals

learn also by imitation; the young imitate their parents and elders. Again, a very important mode of learning is by experience and remembering to avoid actions bringing punishment and to repeat movements bringing rewards. They have muscular-memory, by which muscular movements are reproduced, sense-memory, by which past sensations or feelings are aroused anew, and associative-memory, by which past associations are revived.

12. It has been said that monkeys and apes can also reason, in the sense that they can think out aspects of a situation, look out for means to an end, and dispose of the means to attain the end. The assertion is based on experiments. A monkey was taken into a room in which was a banana hanging from the roof out of reach. There were two packing cases and a biscuit-tin lying in the room. The monkey failed to reach the banana. After looking at it and at the boxes for a while, he fetched them, put one on the other and the tin on top, and getting up on the pyramid succeeded in seizing the banana. This is certainly a singular case, if it were true that the situation was wholly new to the monkey. In fact it is such a strange case that an explanation of reasoning on the part of that particular monkey seems to be given only for lack of any other. The evidence that is brought forward is very meagre and generally of a doubtful nature.

13. The strongest argument against the assumption of intelligence on the part of animals would be this: if animals could reason, there should be no limit to their progress by reasoning. If they do have very narrow limits this has to be accounted for, and it must be shown that the difference in physiological make-up of man and animal would account for different degrees of the same reasoning power in both. We refer here to normally healthy men and animals. To say that it is because man can stand erect or that he can use his thumb and forefinger for grasping, is to give altogether

a puerile explanation; for clearly reasoning is independent of these aptitudes.

14. When a dog makes straight for a gap visible in a wire-fence to get to the other side of it, it is certainly not a case of trial and error or of chance; the dog has had experience of wire-fences or of similar obstacles before.

15. A very simple experiment will point out more convincingly that animals do not reason. When an animal is tied by a string and gets its leg twisted in it, it does not release itself in a "reasonable" manner. We catch animals sometimes with simple traps, which, if they could reason, they would get out of quite easily. A common trick is to make a small hole in a cocoanut and scrape some of the kernel loose within it. A monkey coming across it will put its hand in to secure the contents. Its clenched fist, however, grasping the kernel, is too big to slip easily out of the opening. He will run along burdened with and hampered by the weight of the cocoanut until it drops off. In that predicament he is easily caught and punished for all his past "crimes."

16. Animals, *e.g.* monkeys, seem to exhibit ***cunning***. But cunning is a precocity in learning by experience to derive some advantage. At this, some animals are quicker than human children, *e.g.* monkeys especially given to pilfering, and some savages than some learned men. A man in whom wisdom and cunning combine in a naive opportunism may be most successful in this world, judged by material standards, but to me he exhibits a most despicable trait, for selfishness predominates in it.

17. Once more we observe that we must beware of projecting our own thoughts and feelings on to animals and of making false interpretations of observations on that account.

18. Dogs and even horses seem to understand our language. It is certain that they can recognise the timbre as well as the expression of voice. A dog recognises a person by his voice. If the master says "Good dog" in a mournful voice the dog will drop its tail; if he says quite cheerfully: "I'll give you the stick," it will wag its tail. But its responses to words of command, while they show that it can recognise differences of sound, are only conditioned responses and do not show that they arouse thoughts in its mind. What is aroused is a feeling, an associated sense-image and a corresponding movement.

19. The migration of insects and birds and beasts is still a mystery, although much ground has been cleared up recently by systematic research. No one will assert that the movement is guided by reasoning. It is no doubt an instinctive movement directed by external stimuli and conditions, food supply, wind and water currents, temperature, odours, length of daylight, humidity. To the instinctive impulse and response to external stimuli may be added learning, in the manner in which insects and birds and beasts learn. Their migration cannot be called intelligent behaviour. In the case of man reasoning comes in. Wild fowl used to migrate to a certain region in Canada, where they bred in countless numbers. Gradually, however, the local conditions deteriorated to such an extent, the swamps drying up too rapidly, that breeding was seriously affected by the excessive mortality among the young birds. There came a time when it was feared that the bird population annually migrating to that area would rapidly die out. Still the migrations continued. It was only by the timely action of a Bird Protection Society that the situation was saved.

20. What then is meant by Intelligence or Intelligent Behaviour? Very often we call an animal intelligent, if it is quick at learning by experience; but this is a loose application of the term.

21. Not all men's operations may be called intelligent. Man's behaviour is often little more than animal behaviour, and is almost wholly explicable in terms of the latter. Even in that behaviour which we designate specially as human, there is a great deal in common with animals; but in it we also detect peculiar traits, so that it cannot be explained in terms of animal behaviour alone; and because these traits are superadded to animal behaviour, we recognise it as of a higher order. To give one instance again: man, like animals, can produce sounds with his breathing apparatus, but he can so plan the sounds that he can produce and make them into Speech.

22. In the course of the above, we have already given examples of behaviour peculiarly human. It shall be our endeavour in the sequel to investigate human behaviour more fully, especially in its aspect of Mind.

CHAPTER XIV

THE INTELLIGIBILITY OF THE WORLD

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1. That the world is intelligible is partly a restatement of the Axiom of Realism or of the Causal Theory of Perception. That the world *can* be known and that I *can* know the world, follows from the *fact* that I do experience the world and apprehend it something of it at least. It exists in its own way in itself; and it exists in the mind in a special way, with an ideal being. It is the basis of my actual knowledge; it offers me knowledge of itself through my sense-organs and my senses. Intelligibility, as we have said before, is more than this: it is not only Apprehensibility but also Comprehensibility.

2. We comprehend the world in a small way, by establishing objectively the real relations of things to one another and their relative behaviour. In this way we grasp Significance and Value. This is clear at least from the *fact* of Science. We discover in any one substance also an ordination to a Finis not imposed on it by the mind of man, and therefore real. This is true of inanimate substances, but it is more striking in living things. The End of its activities is the perfection of the living thing under its supreme Substantial Form. When it is not in its final Phase, it is the acquisition of the next Supreme Form. The manifestations of the lower forms or energies are directed towards the End determined by the Supreme Form, inasmuch as they are subordinated, co-ordinated, structured and unified by it into a whole energy-object. This Totality-Finality view is largely accepted among biologists today.

3. In a system of physical entities a **real** order is perceived. *Order* is *an apt disposition of means to an end.* Since the Finis and Order are objectively apprehended we may say that there is Real Significance or Truth and Real Value or Goodness in the world. Order can be apprehended by an intelligent being. It is not created by the mind of the subject knowing, nor is it a 'form' of the mind apprehending. Rather, the order in his ideas is the effect of an ordered world. Real Order is the basis of the subjective apprehension of it, from which objective order emerges. The Purpose is not in the subject; the Finis is not in the subject, the world is far too great a problem for the individual mind to set in order even ideally. Nor is order in the world the effect of the collective mind of man. No one will be convinced of this. On the other hand, the mind of man is relieved when it recognises some order; he strives to grasp significance and value. With a great deal of trouble and collaboration, and with many setbacks some scientific knowledge has been attained, *i.e.* ordered knowledge of an

ordered world. The recognition of order gives the scientist a method in his work. Significance is the orientation of the Means towards the End, and the end may be tangentially or asymptotically apprehended, by inference as to what the orientation is proximately or ultimately directed.

4. The mind of man struggles along because its natural craving is not satisfied. It seeks for a unity in its content, which content, is got from outside it. It will quiesce only when a permanent harmony is established. With labour it constructs the edifice of objective knowledge. By abstracting from personal effects it can do this to some extent. But the quiescence will be almost perfect if there is communion, a harmony established within the individual and between the whole individual and his environment. Within his own mental world, irrespective of any further contact with external reality, man also seeks for harmony—within his content of thoughts, feelings, desires. He seeks also for a harmony in his external acts. If there is a Finis *par excellence* which would unify my whole mental content I should be all knowing and all comprehending. This state would be a state of '*Nirvana*', and my present actual perplexity a state of '*Maya*'.

5. This harmony is to be had not only, therefore, in objectively established relations but also in the relations set up in the mind by the mind, *i.e.* in subjective value and significance. These, however, are very liable to change and become more and more stable the more closely they conform to objectivity. It is for this reason that there can be mental conflict and disorder.

6. Thus Intelligibility means more than that the world of reality can be apprehended. It signifies a unification of the world of reality with the mind—a nification that depends as much on feelings, desires

and actions as on thoughts. It is a unification of the internal processes and a harmony of ideas; unity of Significance and Value stringing them all together; a unification of the external acts with each other and with the mind by a Plan or by Purpose running through them and joining them together and by Order towards a conscious End in view—a unification of finality.

7. Man is intelligible to man. That is why man is so pre-eminently a *social* animal. It is this intelligibility that makes Society possible. Motive or Purpose makes the subject's own conscious actions intelligible to himself. By analogy, the external actions of another are intelligible to him. Motive is the Finis consciously set up towards which one's actions are consciously directed or ordered and put into relation with each other and with the end. Motive characterises human actions *qua* human. Man is intelligible to man; but the greatest mistakes are made in our understanding of one another. This is because one cannot easily remove the subjective elements when oneself is concerned in the interpretation of the behaviour of one's fellowmen.

8. Communion is more than an intellectual union. It is a perfect mental union *in se* and *ad externa*. No one actually attains this, at least not in this life, though several have gone very far in the process. Inasmuch as we fall short of it we are in conflict. No man is perfect, and some, more than others, are at variance with themselves and the world.

9. Is Intelligibility some 'form' of the mind or a form that the mind projects into the world? If it is a form of the mind then so also is unintelligibility. If it is projected into the world then the mind projects also chaos and unintelligibility and more of this than order and intelligibility. It is in fact with the greatest difficulty that comprehensibility emerges, and not by

the efforts of one man alone but also by the combined efforts of all men. Our mental struggle arises in a great measure from the separateness, disunity, multiplication, chaos, that are projected into the world, and even worked up within the self. This can be vouched for by the psycho-analysts of the original Freudian school and also by Adler and his collaborators.

10. We have said that we strive for unity within the mind. At any one time, only some little thing is in consciousness. However, in the chain of thoughts, feelings, desires and actions that can **at any time** arise there should be this unity. Even a Finis is not constantly in view in our ordered acts. It is there potentially as a motive which has directed the acts and readily comes up into consciousness to keep them ordered.

11. To acknowledge that the world is intelligible is not to concede a postulate; but it is the recognition of a **fact**, the fact of intellection. The attempt at any systematic study is the recognition of a fundamental harmony in this world, which we do see, though vaguely, and to see which more clearly there is an inner urge. This urge is also a fact to be recognised. The success in our attempts is an experience of harmony even in apparent chaos, of concord even in discord. This harmony is not merely the result of a subjective unity put into experience.

12. If Intelligibility is imposed on the world, it is not by the human mind comprehending it, but by the divine mind planning it. We see similarities also in plans and structures. We do not say that there is something absolutely the same in, say, two men. They are similar, *i.e.* have an essentially similar plan. Similarity is not the same as Identity. The identity is from the idea in His mind, externally represented by similarity. **It is the chief factor in intelligibility.**

Similarity in individual substances and in events **point to a common origin** in the Mind of God, to a plan in the Universe. The striving to be one is a divine spark given to us by God, and so our minds respond to similarities. "Let Us make man to Our image and likeness." (*Gen.* I, 26.) Any unification, however, that we achieve is always at the expense of a wider one, even in our mental life; and that is why 'deification' is impossible.

13. The similarity is **real** inasmuch as it is not dependent on the mind of man. *A Species* is a group of living beings which all behave in the same general way and **whose individual variations of behaviour can be expressed in terms of the common tendencies and of lower tendencies only.** There is in a species a special or typical plan, and in an individual an 'individual' plan, including the 'special' one and with additions to it. It is that by which the living thing is 'individuated' *i.e.* marked off as a distinct individual. This individual plan is the result of the particular internal energies going to make up the entity, and of its reactions with the rest of the world.

14. When the individual plan persists there is endurance of the individual, and this we call Identity. Endurance of the individual plan is thus the basis of identification. This may be compared with Dr. Levy's opinion. (See.....above). It is the basis of that social acceptance of identity which he speaks of. A substantial being has a relative permanence and retains its identity in spite of accidental changes. There is some identity persisting for a time in its matter, but the identity of the individual is not the same as that of its matter. It is said that in seven years the whole matter of one's body is changed. Such a statement would be absurd if we cannot identify the individual. Even in things that are clearly not substances, we see the same. Heraclitus said that no man bathes in the same river twice. In

this he certainly did not take the term "river" in the commonly accepted sense, the essence of which is a plan. In fact, speech itself would be impossible if there were no acknowledgment of any endurance of plan. There is a social acceptance of identity and it is based on reality. A man recognises his own identity above all. In a very abnormal case, he "loses his identity," even though to others he is the same person. This would be because there is no continuity or permanence of plan in his mental structure.

15. A great problem in Philosophy is to explain "identity in difference." A confusion of Similarity with Identity has led to Absolutist theories. Identity has been assumed, and that which is supposed to be "identical" in all things and to underly all diversities and changes is held to be the Unchangeable, the Absolute. (Our notion of the Absolute is very different. It is that being which, though Real in itself, is related only ideally to other beings, and to which they are really related. The word "absolute" is the opposite of "relative.") Hegel himself could not attribute reality to it. If, however, we note that similarity does not necessarily imply identity, then we must look upon it as the result of planning or ordering by an Outside Being. If there were no similarity, there would be no Science, no Speech, no Knowledge whatever; nor could there be any planning by us or any directing of our actions. The identity is in the mind of the Designer, the Architect, the Unchangeable, the Enduring, and similarity is an external manifestation of it. The very notions of "change" and "permanence" (we do find some relative permanence in this world) imply similarities also. Thus similarities are most obvious, and they indisputably point to the existence of God, the Absolute—not as the unchanging "matter" entering into the constitution of all visible things, as some would have it, or even as the "spirit" as others would by extension see in all things (or as their "elan" or "vital impulse" or "reactivity"), but as a Being

Who in essence and in existence is distinct from them; to Whom they are ordered; to Whom they are really related; Whose relations to them are ideal; Who designs them all; Who gives them Existence but does not lose in the giving; Whose glories they chant in the manifestations of their derived powers, in particular of mental activities and freedom analogous to His. **To Him be all honour and glory! Amen.**

16. Several philosophers, from Plato onwards, have found true permanence only in *ideas* or *universals*. These are based on real similarities and are the bases of knowledge. They are the human reactions to the manifestations of divine design.

17. Intelligibility and Order, Significance and Value, come from the spirit and by the spirit are they apprehended. It is not the regularity of determinate causation that gives the final lexplanation; nor is it the determinate probability of indeterminacy. It is the true freedom of free causal activity that ends the search, and only there can we stop. A very meagre freedom is enjoyed by the human spirit; but that little is quite enough to indicate the nature of a free cause, the nature of spirit itself. Just as in tracing a series of efficient causes we come to a full-stop at man, the free initiator of the series, so also in a train of ultimate causes we come to a full-stop at God.

18. Form seems opposed to form, each striving for its own manifestation, but all together manifesting a unity of design, a Harmony and an Order in which each takes its place. Just as in a picture each colour is opposed to every other, each line to every other, while all the colours and shades and lines together form a harmonious whole with a significance which is only that of an intellect, and a value which is that of the will, so also the great world of ours appears as the spontaneous act of a Free Creative-power, an external

faint expression of the Goodness and Truth and Beauty that essentially constitute The Absolute.

The Intellect

19. The Intellect is the person in his psychic behaviour viewed under one particular aspect. As a concept it is an isolate of the very complex concept 'man.' When we speak of the Intellect as a 'faculty,' it is in this sense.

20. The main tendencies of the intellect are to select and to combine; to isolate and to extend the isolation in the manner of Mathematics with its 'and so on' or of Physics with its 'as if'; to analyse and to synthesize. They are all one and the same tendency—to unify. There is an urge for unification of the mental content as part of a wider unification. We strive to perceive oneness as part of the being one with the world.

21. Even when I concentrate on my thoughts and avoid distractions, it is because I am striving for a more limited unification. There is so much of perplexity and mental perturbation accompanying each chain of thought without any more being apprehended from outside. There is a tension arising with a want of co-ordination of our thoughts; still more if feelings, desires and actions are taken into consideration. A break-down, both moral and physical, in face of difficulties to be overcome in the struggle, can well be understood, as physiological reactions correspond to mental strain, and the strain of willing has very far-reaching consequences. If I am not one in my Self, there is strife; if I am not one with the world, there is strife. So we have a Principal of Psychical Disturbance: **I cannot be both one and not one.** To attain this unification is to be deified. "Father, I pray that they be one, just a thou and I are one." This deification, by which we are raised supernaturally to be like to God,

is opposed to that oneness by domination by which we set into opposition and prevail, a spurious deification, the reason of the First Fall of Man, and ever since then the same reason for every subsequent fall.

22. An Abstraction, as an 'act of the Intellect', is the direction of the attention to one particular aspect of a thing not considering the others or attending to them. The term is also used for the particular aspect. The thing itself presents itself with so many aspects of itself that we are not capable of considering them all together; and we are constrained by this limitation to consider each one separately, even though in the thing itself their causes fundamentally exist together and dependently on each other. We put together these aspects again into a whole. We only see the whole when we see the parts coalescing into one. Parts and whole are seen together, and disclose a plan.

23. By Comparison and Contrast, the basis of which is Similarity, we are able to isolate simpler concepts and then put them together. The greater the experience, the greater the ability to isolate; for we grasp similarities. A thing absolutely strange cannot be accepted into the mental content. If its presence is forced by external pressure, it causes perplexity; because it is not unified with the mental content. Suppose I get a sense impression, it brings up into intellectual consciousness an image. The physiological process involved tends to bring up an associated process, by some similarity in both. Thus the mental entity tends to bring up another mental entity associated with it. There is acquiescence when there is Familiarity. There must have been previous experience. Otherwise there can be no picking out of common elements. Thus abstraction depends on the selectivity of the sense organs and on similarities in physiological processes.

24. When physical energy is received from an external object through a sense-organ, it is transformed

by the latter into physiological energy and absorbed by the human organism, in which it manifests itself as a mental 'entity', an image or a feeling. Whether there is a sort of 'groove' in the brain-matter, as was at one time believed, or a readjustment of the brain-cells, the process is more easily reproduced a second time and gets more and more easy to repeat with repetition. And it is this Familiarity, a sort of psychological acquaintance, that brings about a mental equilibrium. An impression may upset one at first, but we soon get 'used to it'; we adjust ourselves to it and it becomes part of oneself. When it is not wholly familiar, there may be some sort of similarity in the process with a previous one, and this latter is brought up into consciousness. Then the mind is somewhat put at ease.

25. When the common element is isolated in thought, then we have abstraction. In the same way, feeling can be abstracted and an idea of it formed. The greater the experience the easier and more fundamental does the process of abstraction become, and the 'simpler' do the ideas get.

26. Again, we build up notions from the abstracted ideas so that the set of associated ideas will fit in with the reality apprehended. They may be called Concepts or synthesized images of sense-objects. The building up of the concept of an object is by objective associations of the abstracted ideas, associations forced on us by the manifestations of the object. A concept is also a synthesized plan of the object. The mental image of an object before there is any conscious analysis or synthesis, may be called a 'Percept'. An abstraction is also often called a 'Concept'. The term 'idea' is used for both percept and concept, whether the concept be a simple one got by analysis or a complex one got by synthesis.

27. It is in this way that we become aware of 'identity in difference' and 'difference in identity'

and of change. We can abstract that aspect of an object which remains the same in spite of variable circumstances of time and place. We abstract also in such wise that what is left of the notion, analysed and synthesized, is a plan in itself, the discarded aspects of it being only accidental additions to this plan. Thus we perceive individual identity. It must be noted that concepts grow or become more and more 'true' with external experiences as well as with repetition of the mental processes. They are constantly being modified.

28. The abstraction goes further. We abstract from individuating conditions recognised as existing only in a particular individual. We see a 'special' plan, one common to many individuals, and we recognise a ***species*** or ***class***.

29. A plan is not only of the internal relations of parts but also of external ones, at least of a relationship of the object with the Self. This is the simplest plan perceived. The child has experience of its mother by sense-contacts, and grasps certain relations to itself, its feelings and needs.

30. A plan is in different degrees of detail, and as we advance in experience and knowledge, details are more and more filled in. Some plans have to be very much modified. A Form, as it is in the Mind, is a Plan got from the object known; as it is in the object, it is the Planning.

31. The concept of a thing got by analysis and synthesis is never wholly representative of the particular object. However, the object may be **sufficiently** represented by the connected group of ideas, of its manifested forms and their relations under the Supreme Form. The relations are of actuality within the entity and of potentiality without. The complexity of the synthesized concept would correspond to the

individual thing without ambiguity, so that we may identify the objects.

32. The concepts abstracted from a thing are after all few as compared with the sum total of the 'knowables' of the thing, and so no synthesized concept ever wholly corresponds to the reality. The intelligible-species is like a tangled skein of coloured wool in which it is difficult to follow the course of each strand; it is like a star-cluster easily seen as a whole but of which it is difficult to fix the gaze on a single scintillating point. It is vague because the elements are not singled out, like a forest seen at a distance. It is complicated, and we fail to accept it as familiar unless we detect something in common without other intellections. We need to unravel the tangled skein and separate the strands, to lay one of them side by side with a strand of a like tint from another tangled skein. We need to see the trees singly, at least some of them, in order to recognise them as having been seen in another wood. To separate a single element from the complicated intellection is to 'isolate' it. The isolation of concepts is facilitated by comparison and contrast. When we have two tangled skeins of threads of different colours and shades, we can perhaps detect two threads of like shade one in each skein and draw them out. Still more easy would it be if we had a set of threads already separated and sorted out. So it is with concepts. This, we venture to say, is the process of the mind from the moment we come forth into the world. There is intellection from infancy onwards; but isolation—the unravelling of the elements—is slow and laborious, and synthesis is equally difficult. It is dependent no doubt also on the development of the organs and the nervous system and on the whole physiological structure of the child.

33. What is isolated is not in general an elementary concept, *i.e.*, one which cannot be split up

further. The isolated concept can generally be further broken up by further comparison and contrast, This it is our continuous effort to achieve, right down to the elementary concepts which cannot be split up further, the very bricks of Science and Philosophy. This is the supreme epistemological process.

34. Mere abstraction is not enough. Analysis implies a knowledge of the internal relations. To split up the apprehended percept is 'to analyse'; to set up the elements together again in their order and relations to each other and in the relations of the whole to other things is 'to synthesize'. Man would reach the final stage of intellectual progress when he has analysed all his concepts into their elementary ones and recognised again the synthesized concepts as sufficiently representative of reality. One must know not only how to take a watch to pieces but also to put it together again in working order.

35. Each individual contributes a share in the task, but that of any one can only be infinitesimal. It needed all the intellections of all men down the ages up to the present time for the results so far attained, insignificant in comparison with the final goal. Progress, however, becomes more and more rapid as time goes on, like the speed of a stone falling to the earth; for the work becomes methodical, experience accumulates, and the store of knowledge increases.

36. Isolation can also be made from inexact observations. There is nothing that is perfectly smooth, but we can and do get the idea of smoothness; nothing perfectly straight, yet we have some sort of concept of straightness; nothing perfectly true or good or beautiful, but we do have concepts of truth and goodness and beauty; nothing even that is perfectly One—change, to which everything is liable, negates this—yet we have a concept of unity. Such concepts are called *idealisations*, but they are really abstractions.

37. When we attribute a concept to a thing, we do so with the consideration that it is but one ingredient in the complexity of concepts corresponding to it.

Universals

38. The simplest concepts are evidently the most common or universal. The more complicated the concept the more particular, *i.e.* more limited in application, is it. A *singular* signifies something not shared by or applicable to more than a single entity. A *universal* is something that has reference to many. This it may have either by representation or by causation or by existence. A *universal by representation* is one in which many are expressed as in one mental image; e.g. any common noun corresponds to a universal by representation. A *universal by causation* is one which can attain several effects. Thus any sense-object is a universal by causation as it has different effects on me. A *universal in existence* is one which is apt to be in many and which consequently can be predicted about many.

39. Can we consider an object as if it had something in it wholly and exclusively corresponding to an elementary concept we have in mind? Clearly not; for no concept in our experience gives us that and only that simple concept. Thus there is no *circle*, pure and simple: we have a circular table, a circular coin, etc. There is no *table*, pure and simple: any table gives more than mere 'tableness' to my mind. But it is evident that we do have universals, as the examples cited, which represent particular objects though not wholly and adequately. Is there then something in the single thing which corresponds to that concept? The object manifests itself to me. Fundamentally, potentially, remotely, there is something in it corresponding to the elementary concept. That something is a Plan. That plan in the object is the universal in existence, the form abstracted

by the mind. There is Significance and Value and these are apprehended by the mind from sense-impressions of the thing, directly or indirectly got. There is similarity of structure. The universal has an ideal being with respect to the Designer, in the sense that it does not provide the basis of His knowledge of it, but is itself, the product of His knowledge. It is real to us inasmuch as it is not the product of our knowledge but on the other hand the cause of our knowledge of it. Thus only is there 'identity in difference' Fundamental universality is our reality. It exists in the mind by *abstraction*, *i.e.* prescinding from individuals and individuating conditions. By abstraction it becomes eternal, *i.e.* ideally independent of time and space. A universal is a Form. As it is in the mind of the knowing subject, Form is a *plan*; as it is in the object known, Form is a planning.

40. A universal involves a unity in itself and an aptitude to be in many. The unity is one not only in the name, but also in the entity denoted by the name. which is somehow contained in it. That unity is the Finality, the unity of Plan. There is no entity represented wholly by the universal. Every entity of experience is itself a plan, but a singular, individuated plan. The universal is an abstracted plan, itself contained in a highly complicated singular plan and in more than one such. Thus there is no such thing as a universal really existing in itself pure and simple. In a particular object, it exists, as we said, fundamentally as causative of the concepts. As it is in the mind, it is an idea abstracted from many, to which the name 'metaphysical' universal may be given. By further operation of the mind, it becomes the 'logical' or 'relative' universal, inasmuch as it is applicable to many as well as recognised in many.

41. The metaphysical differs from the logical universal inasmuch as it signifies an abstraction from

singulars irrespective of its applicability to the many; it is one abstracted from the many. The logical universal has this applicability to many in consideration, it is one applied to the many—the abstraction and the application being of course both operations of the intellect. Again, whereas the metaphysical universal stops with this abstraction, the many being the *terminus a quo*, the logical requires in addition a further mental operation. since the many are the *terminus ad quem* to which it refers, the relation to them consisting primarily in its predicability about the many. A logical universal exists as such, *i.e.*, formally as a universal, only in the mind. The metaphysical universal also exists as such in the mind, abstractly and indeterminately; but it is said to exist in the thing also as the constitutive form or concrete plan which is the basis of the concept, concretely and causatively. Universals, whether logical or metaphysical, are neither pure names nor pure creations of the mind. For a legitimate application of a universal, the thing itself must, as a primary requisite, provide the basis of the attribute of the universal to it.

42. A Percept is True inasmuch as it is caused and there is an adequation of the effect with the cause. It represents the object to the mind, for it is the apprehension by the mind of a manifestation of the object. It may be only a partial apprehension. Error would arise if it be considered as the total manifestation of the object. In the same way, if by some mental association some other image is added on to the percept and the whole taken to be representative of the object, there is error known as Hallucination. Thus there may be an image which is not caused by a sense-impression received from outside. The image is a revived one. (Of course, a similar impression and image must have been originally received from without). It is called Delusion when the association is due to the subject himself, and Illusion when there is Suggestion—direct or indirect—by another. But these words

are also used when there is error of Judgment, as when I think that a conjurer has changed an egg into a rabbit.

43. With regard to a metaphysical universal, as it is in the mind, there can be no error, for it is a concept abstracted from objective concepts, and therefore itself objective. Even if it were abstracted from concepts, which are themselves subjectively synthesized ones, the elements of these are ultimately subjective.

44. With regard to a logical universal a further source of error would arise from the application of the metaphysical universal in the mind to the many. Having been acquired, it already belongs to the mental content, and may be 'projected' into a thing in which it is not by association by the subject himself. Thus also we have 'fictions', in which a subjective concept is associated with that of 'existence', not merely hypothetically but also with full mental assent. One sometimes "projects" one's thoughts and feelings into an animal. Concepts (Logical Universals) are called Transcendental when they are applicable to all things whatever, at least to those within our experience. The 'simplest' concepts are evidently the more common and universal. By deeper study there also emerge as transcendentals Truth, Goodness and Beauty, Significance and Value, Order and Finality. Unity and Being are the simplest possible ultimate concepts and they are essentially objective.

45. There are logical universals which are applicable wholly, formally and in the same manner to different members of a group, e.g. the *genus* or the *species* into which we classify living things. These, as we have said, are plans within higher plans. A species prescinds from individuating properties, a genus from *differentiae*,

46. The keystone to the methodology of the concrete sciences is given by the phrase 'as if', while that of Mathematics is given by the phrase 'and so on.' Mathematical 'entities' are creations of the mind, concepts synthesized by the mind. They have relations and 'rules of behaviour', wholly dependent on the method of creation. Their structures and 'laws' are by order of the mind—'and so on'. In the concrete sciences, on the other hand, logical universals (including mathematical 'entities') are tentatively applied to things—'as if'. This is well illustrated even in Biology. We study living things, e.g. as if the Evolutionary Theory holds. We make assumptions and hypotheses and theories. Apart from the basic concepts of mathematics, which are metaphysical and objective, the other concepts of mathematics are all logical universals, but the many to which they are applied are themselves mathematical entities. In the concrete sciences we use logical universals also, but the many to which they are applied are concrete things; we strive to get true notions of things by a proper synthesis of the universals. In mathematics all definitions are nominal in the sense that names are given to concepts. In the concrete sciences we seek for true definitions. In mathematics the universality we are concerned with is that of being included in many mathematical concepts; in the concrete sciences it is that of being included in many percepts. The concept of a thing is a combination of simpler concepts as a complex whole approximating to the sum-total of the knowables of the thing, and therefore corresponding to reality. An inadequate concept is a Notion.

47. The more simple the concepts that are bound together, and therefore the more the relations that are perceived, the more details we see of the plan and the clearer and more exact is the notion. Different sciences may treat of the same physical object, but each from a different point of view; *i.e.* each science has its own set of isolates and method of abstraction. It

is obvious that it is only all such concepts put together that will take us as near to the objective truth as possible, and give us the closest intellectual representation of the reality. In the concrete sciences the aim is to make use of the universality in application of real entities and at the same time to obtain the common or most universal part of the sum-totals of the knowables of all realities; to pick out, as it were, the Highest Common Factor of all our complex percepts. Making use of this figure of speech, we see that the more we factorise the terms the higher the common factor we should get, and it is only when we resolve the terms down to their *Prime Factors* that we can get to the highest common factor of them all. Further, any additional term may upset everything and reduce the common factor even down to unity, unless we employ our energies again to factorise the new term.

48. Our minds all construct one and the same Nature, firstly, because one and the same Nature, *i.e.* a planned Universe, is the basis of all the activities of our several intellects; secondly, because our intellects must all be modelled on the same plan; thirdly, planning and design imply similarities, and these (the "identity in difference") are the bases of intellection; for the mind takes from objects only such forms—ideal in relation to God, who imposed them and real in relation to us, who apprehend them—from their manifestations. "And God created man to His own image; to the image of God He created him". (*Gen.* I, 27.) It is not that we believe or assume a reality to underlie our mental pictures. We do experience the reality, and the experience is by way of intellection.

49. Our sense-impressions are true in that they manifest a physiological mode of being of the subject. They are true also in the sense that they manifest the mode of being of the subject in a certain contact with the object, *i.e.* the reactivity of the subject with the object. The truth is of course partial, as our sense-organs are selective.

50. With regard to the Intellect, its proper object is Form. The Intellect manifests itself in its operations, and so its manifestations cannot but be metaphysically true. A reality manifests itself not only directly and proximately in its relations to the subject but also indirectly and remotely in its relations to other sense-objects.

51. Form or Formal Being reduces itself to Relations. These relations are internal and external, by which a set of energies are subordinated, co-ordinated, unified, and structured, into a whole, which itself takes its place in a larger whole. From the intellectual point of view then, Form is Finality or Plan or Significance or Value, and this is what is abstracted as *intelligible-species*. Every concept, whether simple or complex, analysed or synthesized, is an Intellectual From. Even a Proposition or a Judgment is such a form.

CHAPTER XV

TRUTH

1. Truth is the adequation of the expression with the thing to be expressed. Everything is true in the sense that it manifests its nature. Indeed, the nature of a thing is known to us only from its direct or indirect manifestations. Whether we apprehend all these manifestations, or whether we rightly interpret them or not, the manifestations of anything with its inherent activities and its reactivities with other things are there and they are according to its nature. This is only a re-statement of the Axiom of Realism or of that of the Intelligibility of the World. The truth we speak of is Abstract or Metaphysical Truth.

2. Intellectual Truth is the adequation of the

mental representation of a thing with the manifestation of the thing itself. My mental image or notion of a thing represents it to my mind. It arises from the reactivity of my mind by contact, direct or indirect, with the thing.

3. Moral Truth is the adequation of the outward expression by the subject of his mental content with that content. When he expresses what he has in mind for another to know it, this purposive expression, which is done by Speech—words, gestures, attitudes, etc.—involves Moral Truth.

4. A proposition is said to be 'logically' true if it is consistent with the set of concepts to which it could be allied.

5. Metaphysical Truth, as we have indicated, does not admit of degrees. Truth is but an aspect of Reality, which itself admits of no degrees. If there be any imperfection in it, it is only in relation to a subject knowing, and then the deficiency is in the subject. But in metaphysical truth we abstract from knowledge of any particular subject knowing. We may say that a thing is imperfect or not quite true when it is found that it is not as one thought or would have it to be, *i.e.* it does not come up to one's expectations. But in this sort of talk it is not metaphysical truth we are referring to. A camera does not tell lies, nor does a barometer, nor a thermometer, nor anything else, even if the instrument is defective. Every fact is metaphysically true.

6. Intellectual Truth, however, admits of degrees. This is so because our means of apprehension are selective. Our sense-organs respond to certain definite activities of external objects, and the Mind also is selective in its attention. Consequently, there are degrees in the apprehensiveness of the subject. There are also degrees of contact between

subject and object. Thus there are many factors in intellectual truth, all of which admit of degrees, e.g. contact, perfection of the sense-organs, attention, mental equipment and training, previous mental content. We may add to these the perfection of the technical equipment and the technique used in the observation of external entities. Finally may be mentioned the degree of approach to the object. The object may be even twice or thrice removed from the subject observing it: he may study only its reactions with another observable, when he cannot observe it directly.

7. Moral Truth also admits of degrees. It is a more complex idea. There is not only the purposive expression of the subject to be taken into account, but also the interpretation of it by another (the "observer"). The subject's outward expression signifies what he has in mind. Some of his internal reactions are not outwardly expressed and some cannot be observed. (In this some advance has been made, e.g. in the "lie-detector", by which certain physiological reactions are made manifest to the observer). What the subject expresses intentionally as well as unintentionally, is available to the observer for interpretation. Defects may arise in the expression for many reasons. The subject may not have sufficient training and ability to express himself in the conventional manner or at least in a manner significant to the observer, e.g. if he happens to be uneducated, or if he speaks in a strange language. The subject may be so moved emotionally as to be unable to express his thoughts coherently. (In this case his very thoughts are incoherent and he manifests at least this fact and the strength and nature of his feelings.) He may have physical defects in his speech organs. More important still is the fact that he may purposely hide part of the workings of his mind and also express outwardly that which is liable to a false interpretation. This is possible in spite of

metaphysical truth, because the internal reactions of the subject, even the physiological ones, are not all visible to a human observer, and because the subject consciously controls the external expression so that that only which he wishes to manifest is observable, while he hides his other internal reactivities, e.g., whether or not he has given his assent to a proposition. Thus a man may say an untruth. In general the subject analyses two propositions to which he has given his assent and externally expresses a synthesis of them. When a child says: "I did not break it", in answer to a query, it is derived from the two judgments: "I broke it" and "I do not want to be punished". His "I did not break it" is a synthesis expressed with the purpose that the interpretation of his expression by the hearer will be one convenient to the child himself. An untruth then is an expression intended for an observer with a significance which for the observer is not objectively true, since the observer has only that to go by.

8. On the part of the observer is required proper observation and interpretation. Apart from Interest and Attention, he must be able to interpret the speech objectively, uninfluenced by his own emotions and biases. He must be well acquainted with conventiona modes of expression or at least with the peculiar modes of the speaker. His interpretation involves Intellectual truth. If the speaker knows that the particular hearer will misunderstand him, though others in general or even a very observant person will not do so, and if the speaker's intention was precisely that the hearer would make a false interpretation of his expression, then also there is untruth. An untruth is called a Lie if there is a moral obligation on the part of the speaker to make known something, as much as it is necessary, and in a manner such that his hearer will interpret his saying correctly. This is a point pertaining to Ethics and we shall not enlarge upon it here.

9. Dr. Axel Munthe in his "*The Story of San Michele*" says: "On the whole it is easy to understand the dog and to learn to read his thoughts. The dog cannot dissimulate, cannot deceive, cannot lie. because he cannot speak. The dog is a saint, He is straightforward and honest by nature.....You can deceive a dog who believes blindly everything you say". Munthe has a great deal also to say of Monkeys: " Monkeys can speak quite well if they choose to. The chief difficulty is that they are far too clever for our slow brains. You can deceive a human patient....., You can deceive a dog ....., but you cannot deceive a monkey, for he sees through you at once. The monkey can deceive you whenever he chooses and he loves to do it, often for sheer fun. My friend Jules, the aged baboon in the *Jardin des Plantes*, puts his hands on his tummy with the most pitiful air of dejection, and shows me his tongue—it is much easier to make a monkey show you his tongue than a small child—says he has completely lost his appetite and has only eaten my apple to oblige me. Before I have time to open my mouth to say how sorry I am, he has snatched my last banana from me, eaten it, and thrown the skin at me from the top of the cage ....."

10. It is clear that Dr. Munthe is not speaking here with scientific exactitude. The quotation will remind us, however, that we often project our own thoughts and feelings on to an animal, to an ape more easily than to a dog, and to another human being still more easily. This is therefore another source of error in interpretation.

11. Prof. H. Munro Fox in his "*The Personality of Animals*" says: "Monkeys are supposed to imitate human beings; the verb "to ape" and the French verb *singer* imply this. But such is not the case. Merely because the actions of monkeys are like our own, our anatomical structure being so much alike, have they been assumed to imitate us. A number of

monkeys were once shown that a banana could be extracted from a wide-mouthed bottle by turning the bottle upside down. Only one out of many copied the action and so got the desired fruit."

12. We have already discoursed on Subjectivity and Objectivity. In that chapter we have said almost all we had to say on Subjective Truth and Objective Truth. Intellectual Truth is subjective inasmuch as the mental representation truly represents the subject's own experience of the object. There can be a "subjective falsehood", but this is only in the sense that the subject can suffer from Illusion. When Nelson was told that a signal had been given for the withdrawal of his fleet, he put, it is said, his telescope to his blind eye and declared that he could not see any signal. There is no case here of a falsehood, but it would show how one's attitude may be such that one can overlook or withdraw attention from some very obvious thing. When someone says "I am quite well, I have no fever", he means that he is determined to ignore his illness and carry on as if he were hale and hearty. The same is true of a person in sound physical health who says he is ill. Such attitudes are at first intentional, but may become habitual. The subject associates a feeling with his internal consciousness and pays attention more to this feeling than to anything else. When Purpose comes in, by which the subject purports to mislead himself as interpreter of his own behaviour, then there is mental conflict, and a neurotic state results. If the purpose is not to be one's own interpreter but to get something done in spite of an illness, one will probably suffer for one's exertion. If the purpose, however, is to overcome a malady (*Coueism*) then the attitude may aid in a cure, especially in cases of illness due to mental weakness and even sometimes in cases where good organic functioning is necessary at a critical time; for Cheerfulness certainly aids healthy functioning, just as Depression adversely affects it.

Sometimes a person feels quite well and cannot believe that he is a very ill man. Though the mind is quite active, some of his organs and senses are not functioning and he is not conscious of the disordination precisely for that reason.

13. Intellectual Truth is objective in so far as the personal element in it has been eliminated.

14. Man is naturally truthful. A lie involves additional effort, a directive activity against a natural tendency. The more simple the life and habits of a man the more truthful is he. A child is truthful and acquires the habit of telling lies only gradually. For the same reason he is trustful. The savage is more genuine than the civilised man.

15. A lie is a subjectively forced synthesis. The elements do not fit in together but are made to do so by the mind out of other considerations, e.g. to avoid pain. Consequently there is a mental hiatus. The physiological counterpart of this perturbation is disclosed by the "lie-detector". The reader may know of the superstitious practice of balancing a pair of scissors on a holy book held by someone and asking—ostensibly the book—whether a certain theft was committed by persons mentioned one after the other. As soon as the culprit's name is mentioned (or rather the one whom the person holding the book believes to be the culprit), the scissors fall off. Such an apparatus may be called a "truth detector". It may happen, however, that a particular lie becomes a habit and gradually fits into the rest of the mental plan. Thus the subject himself accepts it as part of his mental life, and it creates less and less disturbance in him.

16. The word "true" is also applied by transference to other things, e.g. when I say "It is true to type", "The thermometer is true", "It is a true representation". The degree of truth in an instrument

of observation is that in which it approaches the "ideal"—*i.e.* that notion of perfection we have in mind. We also speak of "truth of execution", as, for example, when an artist or artisan executes a work in accordance with a plan.

CHAPTER XVI

SCIENCE

1. Science in general is the manifestation of the striving for oneness in the mind of man. It is the striving of the individual not only to perceive oneness, but also to be one within himself and with his environment, for science includes not only study but its applications. Although a study as a rational basis for this being one must be placed more on the intellectual than on the moral level, none the less the perceiving and the being are interdependent and together make up the mental plan. The individual shrives for this oneness with the world in general and particularly with his fellows. We would all be of one mind. There can be no science without human intercourse or without society. In a sense, Science is part of Society: it is the unification of mind in its intellectual aspect and a unification of life in its practical aspect. This manifestation cannot be had in an isolated individual.

2. The individual is greatly moved by his own physiological conditions, his environment, his particular past experiences and reactions, and his individual outlook. Intellectual unification is to be achieved in spite of individual idiosyncracies, prejudices, obsessions, moods, predilections, delusions, passions, *etc.* Since the individual himself is so variable, his intellectual plan cannot be of a permanent nature; and his own vagaries and peculiarities are obstacles to be

overcome. These obstacles may be overcome to some extent in the mass in certain matters. They may legitimately be assumed to counteract each other when we take into account large numbers of individuals and a long period of time. That the assumption is justified is proved by the fact of Science, an actual manifestation of social intellectual unification. Another reason for there being no Science without Society, is that the individual is obviously insufficient. To have the beginnings of a science, we need firstly an accumulation of 'facts'—themselves not distorted in the observing and recording—out of which some unifying principle will emerge.

3. The findings and methods of Science must be these of the 'average' or 'normal' man—a mental fiction like Eddington's one-eyed robet observer, but, unlike the robet, having human social interests, motives, concentration and judgment. The individual must accept the findings as scientifically established facts, and this, in general, he is willing to do.

4. The mental world of each individual is the joint-product of the real world and the mind, and personal traits can be eliminated from 'Science as a social venture', so that what emerges is justifiably considered to be as objective as we can get. In this way, we render it neutral at least to individual characteristics of men. However, in spite of this we cannot get away from a certain amount of social subjectivity as in the kinds of facts paid attention to. A society may be considered as having a 'social mind', and there is no absolute permanence even in the mental plan of Society.

5. All the same there is some degree of permanence in the changing world, and this is especially manifest in Man. From the whole History of Science does not this conclusion at least emerge, that the human mind is of the same type now as ever? That

there is the same striving for mental unification in the individual as well as in society through the ages? That the process of unification is unchanged? The very changes in scientific theory and method confirm this. Even History has not shown that the human mind is not constructed on the same plan now as before. If it were so, we should never understand man; there would be no History. We study the doings of our forbears, we interpret their behaviour by sympathy, and we inherit the legacies of knowledge left by them. If you would say that we read ourselves in History, and so do not have to account for the oneness of manifestation through the ages, you have at least to account for the oneness in an existing society, and for the 'social assent' given to Science. In Science itself the oneness of facts emerges. If there were no permanence in the changing world, there would be no Science. Laws and theories are expressions of the plan of a material world of dynamic equilibrium. In spite of the changes in scientific news and views, the world is not so changing that nothing underlies the change.

6. The manifestations of my thoughts and processes of thinking as apprehended by you are objective to you, the onlooker; it is my experience of them that is subjective only to me. By 'social assent' taken not only *hic et nunc* but throughout the ages, the objective element of facts (as apart from the interpretations of them) is left intact and the subjective element is largely eliminated. In a small geographical area, or a small social group, or a small period of time, the subjective element will be strong, for social interests and prejudices and needs will enter. Hence we must take 'social' in its widest sense. Such then is **scientific objectivity.**

7. We must distinguish between objectivity and Reality. These words are in general so vaguely understood and so loosely used that confusion in thought

and speech easily results. We shall speak of a percept only as subjective or objective, and of the thing itself as real. Our percepts are both subjective and objective; subjective with regard to their individual peculiarities and objective inasmuch as the percepts represent reality for man in general. A real thing is *that which, existing apart from and independently of the mind, is apprehended as causative of the objective percept of it.* To believe that a percept wholly represents the thing is to attribute existence to an isolate itself as such independently of the mind; this is a fiction and involves an absurdity. (In our definition we have used the expression 'objective percept' advisedly, for a percept may be to such an extent subjective as to be an Illusion). If one should ask: How then can you ever say that a thing is real? We should answer: From the objective fact of apprehension and from the objective relations of causal influence. But we do not assert that the thing exists in itself in the manner that it is in our mind. A percept is the mind's way of apprehending the manifestation of the object. It is the mental reaction to the received energy. Objectivity then is not the same as Reality. The opposite of Real is Fictional. (This word is better than 'unreal', as the latter applied to a thing outside the mind would involve a contradiction. No thing in itself is 'unreal'). A fiction, as such, exists in the mind.

8. When we consider concepts and judgments, we see that they also are based on Reality and consequently enjoy some degree of objectivity; but an abstraction as such does not exist, i.e., the reality is the basis of percepts from which the abstraction is made by a mental process, but there is no real thing which by itself is perceived as a mere abstraction. Thus there is no such thing as just Man, or a 'normal' man. These are abstractions from complex notions. The same is true of a concept which is a synthesized idea made up of abstractions, and also of a judgment,

which is the result of a mental process of analysis and synthesis.

9. Thus 'abstract' ideas are based on reality. They are largely objective when they enjoy 'social assent.' Inasmuch as they are abstracted from the individual's feelings and desires, they have a degree of permanence. Indeed, objective ideas all have some permanence, the more so the more objective they are. In this sense they are eternal. This is the ideal plane, the realm of ideas. Opposite to the ideal is the concrete. Every idea is concrete inasmuch as it is not a final or elemental abstraction, i.e. has not reached the furthest limit of abstraction possible.

10. The Positivism represented and named by August Compte, would only recognise the experienced as 'real', but it would even give reality to the abstraction of which the physical sciences take cognizance. When the experiences of the whole human race—and even the knowledge acquired by Compte was socially acquired—have to be reckoned, we see the absurdity of isolating the individual's experiences from those of mankind. Moreover 'fictions' were involved in Compte's reasoning. That is why in later life he invented a new religion and worshipped his fictions. Subjectivism is also connected with fiction—the fiction of isolating the individual mind from the world.

11. The criterion of objectivity is 'social assent', taken in its widest sense. Scientific theories are only tentative and largely subjective. If objectively established, they become Laws. Ultimately it is facts for which objectivity may be claimed.

12. Objectivity admits of degrees, whereas Reality does not. A thing is either real or fictional (i.e. does not exist as such a manifestative entity). All the scientists of an age may agree as regards some theory; at the most, that it is a law is only an assumption,

legitimately made until disproved. Should one new fact be established not in accordance with the 'law', the latter has to be abandoned. A theory borrows some derived objectivity from the facts which it agrees with. When a theory is held only by an individual or a small set of individuals on account of feelings and desires associated with it, the most proper term for it is Doctrine.

13. To repeat, Science is the manifestation of striving to perceive oneness in the objective world as part of the being one with it. It is of fundamentally human origin, possible on a grand scale only as a social venture. The 'social assent' required for a fact or a law to be scientifically established can only be had in a limited sense, i.e., in a particular society and particular age. Hence it is not an absolute positive criterion of truth. Negatively, for the rejection of so-called 'facts' and 'laws', it is of far greater value.

14. The Method of Science is the method of the mind. Since a unification of ideas may be had either by obtaining an underlying common abstraction or by putting them all into a common plan bound together by relations, we have the methods of Isolation and Extension, a withdrawal from a larger unity and an inclusion into a larger one.

15. In Mathematics we are almost wholly in the ideal plane. We use isolation to get our fundamental mathematical entities (number, straight-line, etc.), and extension to synthesize and build up operands as material for further work. In the natural sciences the concepts are much more concrete. Isolation (abstraction) cannot be carried too far. Extension would correspond to comprehension—the viewing of an objective percept in all its relations to other objective percepts. A percept with all such relations added to it is a concept. The relations are also isolated by the mind. A mathematical explanation is

a unification by familiarity with logical processes; an assimilation into an ideal scheme. A 'scientific' explanation is a unification by familiarity with the objective processes of Nature, an assimilation into a concrete scheme. In science we are constantly analysing and getting simpler and simpler isolates (for every isolate of a concrete reality is a unique combination of sub-isolates), and we are constantly synthesizing them into complex concepts to correspond to the concrete realities as they manifest themselves to us.

16. In the process of actual analysis, however, something is always lost—the organised wholeness of the entity. The mind gives oneness to the complex concept of it; but in the thing the oneness is of a much higher kind than can be apprehended by the mind alone. Rudolf Allers in his study of Character says that all we can do is to reduce an individual into a bundle of types. If the manifestation is apprehended as a unique combination of isolates necessary and sufficient for practical identification, this is enough and suits our scientific convenience and desire for unity and simplicity. We must always, however, keep before us these limitations of science; for otherwise we shall lapse into serious mistakes, especially in the study of man. The mental striving for unity is itself a check to that tendency to split up.

17. In scientific practice we also use isolation and extension. An object manifests itself in a dynamic reactivity, with all other objects, disclosing a oneness too vast for the human intellect to comprehend. The parts have to be isolated and the whole reconstructed. The reactivity, in practice, has to be studied little by little in more and more varied and wider environments. In scientific experiments, we have recourse to isolated systems. An isolated system is one that is neutral to its surroundings. The instruments used for measurement or manipulation of the

system must be neutral to the system and together with it form also a neutral isolated system. We cannot, of course, have perfectly neutral systems, and hence we have to compensate for all sorts of extraneous effects that enter into our experiments. The practical method then of science is Isolation. The degree of isolation depends on the nature of the experiment and is itself a matter of experiment, while the amount of it actually obtained is dependent on technique and technical equipment. The first function of experimental enquiry—says Prof. Levy—is, if possible, to find precisely how little of an environment need be included to render a system neutral. That it is possible, e.g. in an experiment in Chemistry, to get always consistent results with a great degree of precision, shows that the possibility of an object's influencing the result depends on the sufficiency of contact. This Prof. Levy does not observe. Below a certain limit the contact is insufficient to influence the result. We erect barriers to reduce the contact of the external world with our system, so that for the purpose on hand the contact is less than sufficient to affect the system in an undesirable manner and the system will be a relatively-isolated one. In nature reaction is 'All-or-nothing'.

18. Science uses such relatively-isolated systems in order to study the reactive relations of objects. It discovers 'laws' or consistent modes of behaviour. When technique had advanced and shown that the law is not quite verified, i.e. quite in harmony with the facts observed, it may be because the supposed relative isolation has not been obtained. The disturbing factor has to be found in it and studied by elimination or by deliberate inclusion into the system. Thus Pasteur showed that organic life found in water did not originate in the water itself.

19. It is most important to note that Isolation and Extension observed as phenomena of nature do

not represent tendencies fundamentally opposed. They are both modes of unification; Extension is unification in a larger whole, and Isolation is the strengthening of a narrow unity at the expense of a wider one. Both Isolation and Extension, therefore, imply a want of perfect union.

20. There must be a guiding principle by which facts are chosen for observation and a method invented of collating the facts. It has often happened that a doctrine or hypothesis has led to its own dethronement. The danger of a hypothesis is that if its provisional nature is not borne in mind it becomes a superstition. Its value lies in the fact that it is directive of interest and experimental research.

CHAPTER XVII

ILLUSIONS, REVERIE AND DREAMS.

1. The term Illusion generally means a spurious act of apprehension, by which a sensation is attributed to a particular mode of reality which does not exist as such. The simplest example of illusion is obtained in ventriloquism, by which the hearer is induced to refer the tones or words produced by the ventriloquist to his puppet. The sight of the doll, and its appropriate movements are associated with the sounds, which are consequently referred to it. Hearing is not very definite in the determination of direction or distance of the source of sound; in fact, discrimination by this sense is only developed in association with the other senses. A rustic taken for the first time to the cinema, even though he may be told that the show is only a projection on the screen, may soon believe that he is seeing actual life. (It is known that an excitable and gallant cowboy once emptied his revolver at the villian oppressing a maiden on the screen.) In a fog one may mistake a lamp-post for a policeman or an assassin.

2. In illusion is involved Error, as is clear from the definition given. (When the error is of a somewhat permanent nature and refers rather to relations perceived than directly to sensations, the word Delusion is used. Thus if Mr. A. firmly believes, erroneously, that Mr. B. has always acted against Mr. A's interests, it is a delusion; if the error is only transitory, it may be called just a "misunderstanding.")

3. The sources of error in Illusion are various. On the part of the subject there may be defects in his sense-organs, or disorders in the cerebrum, or non-co-ordination of sensations, or great suggestibility, or weakness in thinking, or extreme excitability.

4. External impulses may be short-circuited to the brain, giving rise to sensations similar to those which normally come through a sense-organ. Again, intense stimulation of any one of the senses renders it insensible for a time to lesser excitations. Some drugs deaden certain modes of sensibility, others excite them. When certain brain areas are affected by disease or lesions, co-ordination between certain sense apprehensions becomes impossible, and illusions may result. Fevers heighten subjective impressions, especially of the organic kind. When the subject is affected so very greatly by an impression that he becomes incapable of reasoning, i.e. of co-ordinating his present and past experiences, he will not be able to distinguish between objective impressions and subjective phantoms of the brain. An aberration of this kind of a somewhat permanent nature is commonly termed a hallucination. John Smith who firmly believes he is the Emperor of China is said to be "possessed by" a hallucination.

5. Abnormal working of the interior physiological processes gives rise to sensations with associated images and feelings, which may be so vivid and intense as to bring about illusion. The prominent mental

attitude and that immediately antecedent to an impression received from without, have a great bearing on the manner in which the impression is apprehended; for the apprehension brings up by association feelings and images. When excited, if one has a lively expectation of some event, one is likely to mistake anything ever so slightly resembling it for the anticipated event. The physical concomitants of imagination are similar to those of actual sensations. In all thinking there are of course resuscitations of past experiences though in new forms. When therefore expectation is strong, the mind is, as it were, set for the event. When an external impulse is received to some extent similar to the expected one it sets the mind going in a manner almost predetermined, so that one may even perceive an event before its manifestation or visualize things that do not exist. An author is a bad proof-reader of his own work. In this way people see ghosts and children fairies. The pain or pleasure may be as intense as if the referent were a reality. Antecedent feelings, e.g. Love, Hatred, Jealousy, Desire, Fear, also aid illusion.

6. We often see that which we crave to see and also that which we detest. When feelings, associated strongly with certain mental processes, are aroused, they tend to bring up the same mental processes and other associated ones. Thus also imaginations that one had in the past even vaguely are revived and referred not to the past but to the present. Strong feelings tend to bring up over and over again images that one may even detest or fear.

7. There are also external sources of error in Illusion. They are indirect. Unusual conditions of the environment may bring about deception. Thus we have mirages and spectral apparitions produced by reflections (Pepper's Ghost.) The senses report correctly, but we pass on from their immediate data to indirect and acquired perceptions. We are taken in

by the skilled conjurer, however carefully we watch his every movement, precisely because we are suggestible. Optical illusions regarding shape and distance of objects arise not only for lack of objects for comparison but also from conditions of the atmosphere or other circumstances. The error arises in the judgment hastily formed.

8. Ultimately we have to trust and do trust sense-impressions, i.e. we trust perceptions based on them; for we have the means of obtaining objectivity in knowledge by collating the experiences of all the senses and of many individuals, and of the past and the present.

Dreaming and Reverie.

9. Dreaming and Reverie are both forms of illusion. In Dreaming mental processes take place during sleep, while in reverie they occur in wakefulness. During sleep the external senses are dulled; there is no directed attention or volitional control of the thought-processes; there is no co-ordination of sensations; nor is there mental comparison. The flow of thought-feelings goes on according to the laws of association.

10. There is a verisimilitude or apparent reality in a dream chiefly on account of the cessation of the external senses. The images are not subject to correction as they are in waking life. In reverie also there is no active control of the thoughts; but, as long as one is awake, the stream of various sensations, although attention paid to them is very slight, exerts a steadying check on the flights of fancy and one readily returns to the realm of reality, the more so because volitional control is not altogether cut off. In sleep both checks are in abeyance. When we awaken from sleep or recover from reverie, we quickly realize the illusory nature of the recent mental processes and attribute them at once to dreaming. The memory of them is generally vague.

11. Several actual sensations, dulled in sleep, initiate or influence the dreams. These together with fortuitous associations, uncontrolled and unchecked, result in inconsistencies and extravagances. Without directed attention and comparison the train of thought becomes incongruous, with no reflexion on their incoherence or absurdity. In Reverie, however, volition rarely sinks into complete abeyance, and any notable extravagance or absurdity brings back the subject to active life.

12. In spite of the vagaries of dreamland there is sometimes enough of coherence in at least a portion of the train of thoughts to form a connected story. It is only such dreams that we remember on waking; while a mere jumble of disconnected images only leaves a feeling of perturbation or uneasiness on waking with no distinct memory of them. The coherence probably results partly from an orderly succession of previously associated ideas and partly from a power of selection left by the dominant tone of conscious life.

13. The great majority of the external and organic sensations are excluded in sleep. Any, however, that do enter, feebly of course, e.g. touch, pressure, sound, enjoy therefore a favoured position, being vague, isolated, detached from other distracting sensations, and consequently holding the field, as it were, to themselves. Hence it may have an exaggerated effect, usurping the consciousness and assuming tremendous importance.

CHAPTER XVIII

VOLUNTARY ACTION

1. When we speak of voluntary action, intelligent action, instinctive action, etc., it must not be supposed that they are actions by different parts of the composite, or that they are so marked as to be immediately recognizable as belonging to one class or another, or that their mechanisms are different. What we wish to imply is that certain actions, while being similar to those of vegetable and animal life, yet also show certain aspects, in different degrees of clearness, which are found only in certain individuals, by which they are characterized and by which alone justification is had for putting them into a class by itself—MAN. If we should endeavour to frame actual laws of the type: *If snuff be applied to the nose of a man unaccustomed to it, he will sneeze*, and go no further, only looking for inevitable immediate sequences of "stimulus" and "response", we should be deliberately shutting our eyes to certain aspects of human behaviour, and though setting up man for study, we should not be regarding him as Man. With only a meagre experience, when "scientific" classification was not even thought of, this class of individuals was recognized; at the same time "voluntary action", "responsibility", and the like were sufficiently understood.

2. A physical movement can be considered in parts. Ideally there is no limit to the subdivision of time, and for the Atomist there is no reason why he should stop at an interval greater than the least practicable division of time. But such a method robs the whole of its wholeness and significance; every "elementary" movement, as it may be called, loses its meaning and its connection with the next; and recourse must be had to Chance for an "explanation" of events. When a movement is taken as a whole it has meaning, and something can be made of it in the

biological plane, e.g. it may receive an evolutionary or genetic or morphological or other significance; and still more it renders possible the gleaning of higher significances, the glimpsing of higher aspects, just as a solid, three-dimensional body can give many views of itself, which a two-dimensional or one-dimensional or zero-dimensional body cannot; nor can a physical solid be considered merely as a compact ("continuum") of mathematical (zero-dimensional) points.

3. A voluntary movement has several aspects to be considered over and above those of instinctive movement. We may call them psychological "elements" inasmuch as they may be viewed separately or in isolation (not because we take them to "combine" by a sort of "psychological Chemistry" to make up a "psychological compound".)

4. There is a mental representation of the proposed act, its extent, direction and velocity. Accompanying this, especially if the operation is unusual, is a faint imaginary rehearsal of the movement, in which is an estimate of the quantity and quality of the muscular effort to be employed. Finally, there is the volitional *fiat* by which the operation is set going by the discharge of motor energy into the proper channels, so that the imagined action is realized. These "elements" are easily seen in any common deliberate action of every-day life, e.g. making a stroke at billiards or tennis or cricket.

5. The "estimate" referred to is not always consciously made, though sometimes it does enter into consciousness, as when I say "I must hit hard"; but it is somehow in experience, having come from previous experience. Thus, when jumping across a drain we generally use just the requisite amount of muscular energy to take us across, neither too much nor too little. When it does enter into consciousness *as* an estimate, e.g. in a stroke at billiards, it is by the image

of a muscular feeling such as was previously experienced in an actual stroke. Nor are particular muscles picked out consciously. (Perhaps one does learn later the existence of such muscles and how to control their movements; there is an intellectual and a volitional aspect, but even here control is by anticipated muscular feelings.) In a volitional motor act, however, there is selection of the muscular feeling to be actualized. The consiousness of volitional control and anticipated muscular effort has been called the "feeling of innervation", also a "set" or a "setting". It is an attitude taken up. In a race we are accustomed to hear the starter's cautionary: Get Ready! Get Set! Whatever be the physiological nature of the setting, it is by its active control that the direction and strength and velocity of the movement is determined.

6. The thorny question is: How are the instinctive actions of early life converted into the freely directed complex actions of later life in which instinct is so much obscured?

7. Many theories have been proposed. In the last century Dr. Bain announced a theory of *random* action. In the infant organism, he said, there is a fund of spontaneity disclosing itself in a number of movements of an aimless character. The young animal frisks and gambols in a purposeless manner, its surplus of motor energy is liberated by action of any kind. (This is the origin of the *Play Impulse.*) The Law of Self-conservation that *pleasure is accompanied with heightened energy and pain with lowered energy*, shows how this random action gets definite shape. Among the haphazard movements some give a pleasant experience, others a painful one. Those movements bringing pleasure tend to sustain themselves in consequence of the heightened energy; while those bringing pain tend to be suppressed in consequence of the lowered energy. By repetition certain movements become associated with pleasure,

and after a time the mental representation of this pleasure alone is able to excite the associated action. This Bain called *free voluntary control!*

8. Bain's Law of Self-conservation was rejected in general and even contradicted; for Pain often augments activity, while Pleasure tones it down. Rapidity of acquisition and the complex nature of many of the acts of early life are not sufficiently accounted for by Bain's explanation by fortuitous successes and associations. Instinct, it is urged also, is a sufficient explanation for similarity in acts. Moreover, it is obvious that voluntary movement cannot be identified with random action put into shape by pleasure.

9. Others insisted on reflex action and instinct as the basis of voluntary movements. Even instincts, more complex than reflex actions, exhibit an unconsciously purposive quality. Human infants exhibit less instincts than the young of animals, and many of those instincts take a longer time to develop. When the appropriate muscles and nerve centres have matured, some instincts show themselves with remarkable suddenness, and new aptitudes are perfected with a rapidity not accountable for by the associationist theory of fortuitous successes. It is generally agreed that, among young animals at least, the three strongest factors in learning are:—

(1) Repetition, producing physiological habits, (2) Imitation, and (3) Experience, i.e. by making mistakes and remembering to avoid them in future. We may call these "Learning Instincts", in the sense that regularities in modes of learning can be put under these heads. The Instinct of Learning by Experience can be resolved into the Instinct of Repetition together with the Instinct of Self-preservation, of which pleasure and pain are natural directive factors. Even in making mistakes the movements are not altogether

random; instinctive behaviour is modified by the variation of the environment and the concourse of its impacts on the individual. Since instinct is fixed only in its broad outlines, there must be a tentative character in its details. All are agreed that there is a fourth form of learning, particularly characteristic of Man, viz., Reasoning, by which is understood keeping an end in view, picking out the various aspects of the present actual situation and of the envisaged one and selecting and ordering intermediate situations as connecting links between the two. This would require an ability to "abstract", such as is manifested in Active Imagination, in Active Memory, and in all other volitional acts where active control, association, and dissociation, are exercised. Some would attribute reasoning to certain animals other than man, e.g., apes and dogs, but the evidence is so far meagre and unconvincing.

10. In voluntary action desire is actively associated with the end and through it with the means. The end is envisaged at least vaguely, and appetite or desire associated with it; the movement is prerepresented or the plan of the whole reviewed in anticipation—even the motor-sensations or muscular feelings. On their first occurrence, of course, these could not have been anticipated.

11. The child, undergoing obscure feelings and cravings, is stimulated to movement. This movement is of a vaguely purposive or instinctive character; but in movements to get rid of surplus energy or pain there is indefiniteness within certain limits. There is indeed a tendency to repetition in general and a tendency to repeat movements accompanied by pleasurable sensations and to check those bringing pain. Later on, movements not in themselves connected with pleasant feelings may be indulged in, precisely because they have by active association become so associated. Variation in movement is due not only to new attendant

circumstances and to new environmental impacts, and to some extent to the tentative character of its details, but also to new aspects taken and to renewed control. In the regularity found in the details of a movement is seen the associative tendency and the growth of habits by repetition.

12. Voluntary actions may by repetition involve less and less conscious effort in their performance, and pass into habits. When no conscious effort is required, at least for the development of such movement once initiated, it is mechanical, like to a reflex inasmuch as it is uncontrolled and its details elude consciousness. Each movement is followed by the next without any effort, and even the intervening sensory impressions escape consciousness. Indeed, the individual may perform an intricate act while his attention is diverted to something else. We have an example in reading or in playing the piano. At first we have to undergo much labour and exercise in apprehending each note and pressing the proper key. Later on at the sight of a note the finger does its work; later still, several fingers, as it were of their own accord, press the keys of the chord seen; also the fingers are ready to strike the next notes almost before they are seen. The pianist can play extremely rapid combinations of movements with attention directed only here and there or taking in at a glance several bars. The same is true of reading. Intermittent attention is paid here and there to the script but on the whole "the mind may be wandering".

13. This conversion by repetition of volitional actions into habits is one of the most important factors in the economy of our nature. A great part of every-day life is an illustration of it. Education takes it into account. These mechanical habitual modes of action, which in their acquisition were originally volitional, have been called *secondarily automatic* actions or *acquired reflexes*.

14. Movement can be initiated by sensory impressions and feelings and by volitional effort, but it is found that it can be excited also by the mere mental representation (image) of the action itself. In proportion as the image—especially a motor one—gets more lively, it tends of its own accord to pass into action. "*Vivid ideas tend to realize themselves*". It is because the brain centres involved in the mental representation of the movement are the same as those involved in the actual movement; though in the representation the movement is very much feebler than in the actual experience. Thus the smell of a ship's cabin has brought on sea-sickness even before the ship moved. Most of the movements in reverie, dreaming, somnambulism and the hypnotic state have arisen from *motor-ideas*. The vivid idea of falling from a height is due to the association of the sensation of falling with the visual impression and may lead to an actual loss of balance and a fall. An express prohibition awakens a temptation to violate it, and the continued pondering over an ingenious crime or a lurid or disgusting action brings about a fascination for it by virtue of the vividness of the idea. One sometimes creates a situation that one hates or fears intensely.

15. In intense anticipation the movements and sensations as well as the feelings associated with them, which by mutual interaction due to constant attention intensify each other, are rehearsed in imagination, and each rehearsal becomes easier and at the same time more vivid. Some of the phenomena of "thought-reading" are explained by the detection of subtle physical movements in the "subject" by the thought-reader.

16. Mono-manias or obsessions arise partly out of a morbid condition of the brain and partly from lack of "will-power" or insufficient exercise in actual control of one's movements in general. It is due to giving undue attentions to a "fixed idea" that repeatedly

rises up; thereby giving way to it so that it prevails over other ideas that may come up, and allowing it to become so intense that volitional control, both in its negative aspect as well as in its positive aspect, is rendered negligible. The patient may detest or greatly fear the act, to which he feels so impelled that he finally succumbs to the urge. The feeling that tends to keep the idea constantly in his mind was precisely that great aversion or fear that he had and could not get rid of.

17. Here also the transition from the mental state to the physical act is facilitated by repetition until it becomes smooth and effortless. Some psychologists have therefore identified volition with cognition. This is an exaggeration, for the volitional aspect and the intellectual aspect can certainly in general be distinguished. Perhaps in some cases there is very little of either, so that the subject may not be held "responsible" for his action. But if these cases be examined carefully it will be found that often the subject could have exercised volitional control at an earlier stage before he became "obsessed" with the idea, and for that neglect he is so far to blame. There are, however, lunatics and cretins, who by common consent are not held responsible for their actions, at least for many of them.

CHAPTER XIX

FREEDOM

1. We have been insisting on the unity of the human act. Mind is a manifestation of the human entity to the subject himself and to others. It is a process in and through the body. This is evident from facts, so much so that one school of thought considers it as no more than a physiological process,

and the human act as only a response to a stimulus. This is true to a great extent. Few would deny that mental activity depends on external stimuli through the sense-organs and on the physiological reactions of the subject. We also are often unconscious. Abnormality has been traced to functional disorder. We are all aware of 'mental fatigue.' We go to sleep.

2. But that it is not wholly true is clear from the fact of willing. Indeed mental fatigue arises particularly in connection with prolonged acts of attention or concentration or active memory or active imagination. This is not only because there is physical wear and tear, wastage and need for repair; but more so because when there is willing, the mental process is actively directed in overcoming obstacles, in ignoring distractions, and in constantly avoiding paths along which the mind would slip. The obstacles are of a physiological nature. The directive activity of the mind overcomes indeterminacy or indifference to the mode of formation of physiological associations, breaking existing bonds and forming new ones.

3. Let us first consider 'freedom'. Freedom is the state of being 'free'. 'To be free' is to have no restrictions. Thus freedom is a negative concept. Restrictions are positive in the sense that we experience them. There cannot be a Feeling of Freedom. We cannot experience the lack of things that can be experienced but are not. We can on the other hand have a Feeling of Restriction. We may, indeed, feel degrees of restriction and interpret it inversely as a feeling of degrees of freedom. But an interpretation is not a feeling. Perhaps, then, it is a sort of feeling associated with a knowledge that we are free. In this case, if the knowledge is objective, then the feeling follows the fact and is not an illusion. Many philosophers would consider this particular 'feeling' as an illusion.

4. However, there is another sense in which we may speak of the Feeling of Freedom of the Will. Such a feeling is the experiencing of the directive activity of the mind, or the consciousness of actually directing the thoughts, feelings, desires and external actions. It is the feeling associated with willing. It is possible because willing is against restrictions, and these are connected with physiological states and notions. Willing, like feeling, thinking and desiring, has two aspects, the subjective one of experience of the willing and the objective one of external manifestation of the willing.

N.B.—It would be a fiction to consider the will as an entity by itself. It is the person itself considered in one particular aspect. The concept is an isolation out of a very complex concept. Having pointed this out, we shall speak of the 'Will'. Any lapse into a common mode of speech is by hypostatization, by a figure of speech. In the sequel we shall often use the expression 'the will direct'. This will only mean that the behaviour of a person is viewed in its aspect of being directed by the person. This is a point that cannot be overstressed. It is our tendency to hypostatize, i.e. to speak of an idea as if it had a sort of personal existence, that leads us astray. Any human act is one. It has many aspects, and according to these, we may speak of it as a physiological motion, or an emotion, or a sensation, or an intellection, or an act of the will. If the manner of speaking is allowed for, there will be no confusion.

5. To understand how the Will directs, we must first consider Values. Value is being apprehended in a special relation. It is subjective and objective. Objective value or goodness is being apprehended in its relation of 'able-to-give' to other beings. Subjective Value—or simply Value—is being apprehended in its relation of 'able-to-give' to the Self. A thing has value because I am not

self-sufficient. There is an urge to extend my unity. I feel a disordination in my unity owing to a lack of being. Subjective value, therefore, corresponds to a Need. The feeling associated with value is Desire. Desire is apprehended as such simultaneously with an object set up as desirable. Being subjective, Value is in the mind intellectually and emotionally as well. The term "value" is usually taken to mean 'subjective value'. However subjective value may be, it has an objective basis. It does not arise wholly from the subject. Since Will is directive of mental operations, Value depends on the Will and can also have reference to the future. A future need can be anticipated, because the feeling desire can arise now. In a brute animal value is wholly determined by sensitive apprehension and physiologically associated feelings of the moment, and the animal is moved in its actions according to such values; there is the urge to seek that which is wanting; the feeling is not apprehended as such. When I say: *I am hungry*, I not only experience a feeling but I also apprehend it in myself as a particular sort of feeling. I can have a notion of a feeling. In brute animals the conscious search for such things as would satisfy their needs is always directed by present feelings; this is so even in the case of such animals as store up food and of those that migrate. An urge determined by purely physiological conditions moves them onward. In the case of man, however, he directs his actions towards the future even by feelings subjectively aroused by active imagination, for such 'feelings' are not merely feelings but notions of them. He deliberately plans ahead. He directs the associations of thoughts-feelings-desires and can 'arouse' his feelings and 'picture' them to himself. He can anticipate pleasure and pain. That is why man does not follow periodic movements in his sexual life as animals do. Man not only apprehends values, but he also 'creates' values. Self-sacrifice may have value; even pain may have value; one can 'take pleasure in pain', one can he 'melancholy in joy'. On

the stage the actor acts his part. Even off the stage, we often 'act' our parts, not by sheer pretence but by actual chains of thoughts—feelings—desires—actions subjectively associated.

6. It must not be supposed that the conscious directing by the Will is evident in every act of a man. Man is conditioned by circumstances, by environmental impact, by physiological activity within and reactivity to environment, in most of his actions and behaviour. When the Will directs, it is generally against such influences and comes into evidence as such. That is why there is a strain in our willing, bringing on fatigue more quickly than if there were merely passive physiological reactions. But that is precisely why also we are justified in saying that the mind is not altogether dependent on matter in its activity. That is, moreover, what is meant by the saying 'The Will is Free'. We are conscious of this directive aspect of the mind, and the mode of consciousness is the Feeling of Freedom. Not that we 'feel' the freedom—which is absurd—but that we feel the restrictions arising from our lower nature on our mental processes and external behaviour, and are conscious of the fact that we consciously override them or act in spite of them.

7. The Will directs according to Value; but Value is relative to the Will, although there cannot be Value without an objective basis. Choice arises from the variability of value attributable to the Will. That Will can choose freely, means that the Will can vary values, can give value and so direct. A driver is carried where the car takes him, but the car is directed by the driver. Physical energy is also used, just as the driver must use his eyes and ears as well as the muscles of his arms and legs in overcoming momentum. This picture shows the relation between the Will and the rest of the mental content. But it is only a picture and we are averse to drawing pictures, for they mislead. A picture has visualisable parts, and visualisable parts correspond

to 'fictions'. Will is not a separate entity distinct from the Mind. Plato trichotomised man, i.e. divided him into three separate parts: body, animal soul and rational soul. He had, perhaps, more justification than Descartes, who split up man into two desperate non-coalescing units, body and spirit. Man certainly exhibits non-rational acts, which may neither be intellectual nor moral and are of the same type as those of animals. Our contention is that Man's characteristic acts exhibit also lower traits; and that there is one and only one Substantial Form in man is not only an adequate assumption but is also borne out by evidence. Substantial Form subordinates, co-ordinates, and unifies, all the low energies into a whole—the individual man. Willing is but an indication of the qualities of the Substantial Form.

8. We have said that the Will follows Value, and we have indicated the relation between the Will and the rest of the mental content. By Value we are not referring only to intellectual desirability. Value must be taken as referring to the whole, without any abstraction from the emotional aspect. We all know that logic alone does not compel assent, and that 'example is better than precept'. The will does not necessarily follow what by intellectual abstraction alone is indicated as desirable; though one may try retrospectively to adduce 'reasons'.

9. The Intellect itself is not a separate self-existent entity, nor are ideas entities floating about, as it were, in a box and waiting to come out (or to be illuminated like motes by a beam of light). Every idea, new or old, coming up into consciousness, is one aspect of human activity of which the physiological process is another. In imagining and remembering, past physiological processes are revived into consciousness, and when in consciousness have their psychic aspects. Feeling and thinking are both involved, but one may be more in consciousness than the other. The apprehension

in its more abstract aspect is the thought; in the more concrete aspect it is the feeling. Each thought-feeling has its own momentum, as it were, being associated with other thought-feelings, either through the thought or through the feeling, and in any case by physiological connections only. Actually a thought-feeling is associated with several others in this way, and a line of thought is also indeterminate to a great extent.

10. The directive activity of the mind shows itself in overcoming indeterminacy by keeping the line of thought-feelings in one direction, out of a vast number of possible ones; and also in breaking existing links and forming new ones. The mental direction is primarily towards the achievement of conscious union—union of the self with an object, or union within the self; secondarily towards the multiplication and strengthening of the existing bonds of union. The former implies Extension of the self-unity; the latter, Isolation—an exclusion of something as extraneous, an extrusion of 'foreign matter' from the self. Thus the directive activity of plant life has its counterpart even in the mental life of man; but whereas it is automatic in the former it may be consciously directive in the latter—even against modes that would be automatic in man himself.

Man does not, in general, even in his willing immediately direct his physiological movements, as I would do, say, when I willingly raise up an arm; it is sufficient often even if he directs his human activity in any one of its aspects.

11. Unification with an external object demands external activity. The thing set up in consciousness as a value, gets thereby a sort of directive metaphorical force in the manner of an Attraction. It would be misleading, however, to think of this so-called 'Attraction' as a force. It is only expressive of a natural reactivity or mode of behaviour and of the relations

of being. Since value is apprehended subjectively, these relations are alterable. Desire is the experience of attraction as thus understood. We may say that the subject experiences an Urge towards unification. The Finis or End in view is the value to be united to the apprehended self.

12. The Ego is the Self as apprehended. It bears the simplicity of abstraction, for only one thing is attended to and the rest ignored. It is the idea of the Self. The Self is the reality, the individual as manifestative. The Ego is, of course, variable; for the Self is apprehended in different ways in different circumstances. Any idea not yet unified in the Self is put in psychical contact with the Ego and referred to it. Physiologically it has become part of the Self, i.e. the physiological process accompanying or giving rise to the idea is impressed on the Self.

13. Attention is directed consciousness. Being a process in itself with a physiological counterpart, it is intermittent, but may be continual. Attention itself may be consciously directed. By attention a physiological process is repeated continually and gets more and more impressed on the Self. The psychic process in attention is the reference of the image or idea to the Ego; as it were, the placing of it in the environment of the Ego. The idea or image may become unified with the Ego-content by realations of familiarity, or it may refuse to fit in owing to strangeness; or it may fit in as satisfying a desire or as supplying a need, where the Ego presents a disordination owing to something lacking; or it may itself bring about a disordination and arouse an aversion. In these cases also, it is by previous experience and therefore by familiarity with experienced processes.

14. When the image or idea does not fit in with the Ego, there is the tendency to isolate the Ego from he image. When it does fit in, then the tendency is okeep it there. There is an urge then to make the

reality correspond with the ideal, e.g. to seek to unify the Self with the object whose image was united to the Ego, so that the union may be experienced by the Self. Thus a thing gets Value, and the envisaged unification is the Finis.

15. The basis of unification is Familiarity. There must be some relation between the Ego and the image or idea; there must be some sort of fitting into a plan; so also in the corresponding physiological processes. The Ego, we have said, is variable. An image brought into consciousness is thereby a part of the Ego. Though in the first instance the bond of Familiarity may be wanting, still the image itself is likely to bring up into the Ego some other image with which it has a common bond. Until this is accomplished, there is Perplexity, a feeling of disorder. The experience of behaviour in the aspect of what we have called an urge to unify is Desire; that in the aspect of the urge to expel from consciousness, is Aversion.

16. An image expelled from consciousness is not altogether disposed of; for the physiological process has taken place and is potentially resuscitable, though not exactly in the same form. The Ego with the image pictured as unified to it may be called the Extended Ego. It is the Ego in a new mode, The Will may direct the extension itself, just as it may direct the isolation; and even in the Ego, the association of thought-feelings may be directed by the Will.

17. The mode of unification in the Extended Ego, or the Path to the Finis, may be determined by associations already made or directed anew.

Willing

18. The Will directs the realization also of the Extended Ego, *i.e.* the making of the Self to correspond to it. Then there is action and a pursuit of the Finis.

The Will directs, as we said, associations and dissociations. It can break up certain linkages and form others, dissociating ideas from ideas, thought from feeling, and also associating them. For feeling itself has an intellectual aspect; there can be a notion of it; while on the other hand there is no human activity, however intellectual the aspect it may have, that has not also a physiological or moral aspect.

19. Any other object brought up into consciousness, requiring a unification with the Self as a condition to the final union, is a Means to the End. A Means is, therefore, an intermediate or subordinate end, a sort of stepping-stone to the attainment of a further end. The active mental direction to the Finis is Motive or Purpose or Intention. It is called Motive inasmuch as it refers to actions or movements, not because it brings about a movement; Purpose inasmuch as it refers to the disposition of means; Intention inasmuch as it holds the highest place in the mind. The disposition by the mind of means to the end is Planning. A means acquires derivative Value, *i.e.* value derived from the Finis, inasmuch as it is desirable for the sake of the Finis. Objectively viewed, Plan is Order. Planning is itself a unification in the mind of Means and End, a disposition of them in their relations to each other and to the ultimate end. It is planning that gives intelligibility to one's actions, and manifests the human mind. The order, the End to which it is oriented, points out a mind, in which knowledge and choice of the end and means exist and to which the order is due. Order, viewed as a manifestation of mind in the aspect of willing, is called Design.

20. A Finis has a moral being, Value, and an Intellectual being, Significance, attached to it, inasmuch as it is, as it were, directive of human energy and renders an action intelligible and raises it analogically above the merely physical plane. I discover a purpose in the actions of another only by analogy with

myself. In a series of ends, each is a means to a further end; and the ultimate end to which all the others are ordained gives to each a value and significance. They are all subordinated and co-ordinated into a whole with, we shall say, a Moral as well as an intellectual Unity. Each means is an action done or a state to be reached, and each is for the sake of the next and a condition for its attainment. The ultimate end, though the last to be attained, is the first in my intention. It is the most desirable, since the desirabilities of the rest are derived from it. Finality is that unity of order in a set of objects or operations, which is got by their relations to each other and to their ultimate end.

21. If the ultimate end is not kept in view constantly, there will be inconsistency in one's actions, a want of coherence. An ultimate end may be lost sight of and a subordinate one set up in its place. Thus there can be an upsetting of values. There is the greatest consistency in the actions of an individual as well as of the race when values are least subjective or when they correspond to goodness. Value is subjective not only in an individual, but also in a group or a limited society. In spite of training and discipline, the individual's ability to create a value and set up a finis is never absolutely lost, though the restrictions are seemingly insuperable.

22. A Means must have something in common with the End, and so each End must be kept in view. The plan may be marked out by associations existing through familiarity, habit, etc. The mark of genius is to set up new ends and to discover new paths, or modes of union.

23. An object envisaged as obstructing the path or preventing the unification of the Self and the End is an Obstacle. It is opposed to a Means.

24. The object which is to be united to the Ego may itself be an idea. The unification may be of two kinds, intellectual or psychological, according as the idea is put into the unity of an already united set of ideas or into unity with the whole mental content of thought-feelings-desires constituting the Ego. In the former case, we have a logical union by analysis and synthesis, resulting in a 'conclusion' or 'judgment'; or a mathematical union by isolation and apprehension of the isolate as the unifying bond, or by perceiving the idea as a complex one resolvable into simpler concepts; or a scientific union by fitting it under a known 'law', or by formulating a 'law' to make the idea fit in with the others. Scientific, mathematical and logical union are all reducible to the same. The feeling of acquiescence or satisfaction associated with this union is Intellectual Assent. In a psychological union, on the other hand, feelings have as much importance, as they are also equally in consciousness. The rest of the mental content takes the object in unreservedly into union with itself, the common bond being feelings associated with both. The acquiescence following this mode of union is Psychological Assent.

25. That an idea is of an almost abstract nature would follow from the facts that it can be so tenuously connected with feelings as to be easily dissociated from one feeling and associated with another; that any one idea can be juxtaposed with any other; that ideas are quasi-permanent or at least reducible to simpler permanent ones, in spite of physiological changes in us, and that they are not subject to intensification or quantitative variation as feelings are. Hence ideas are entitled to the term 'abstract entities'. This is also an argument for the spirituality of the human vital principle, the Soul.

26. The question arises: Where is an idea when it is not in consciousness. The answer is that it is in the Self but not as an idea. It is in the Self

in its physiological counterpart; and this can at any moment be revived and give rise to the idea, the idea being merely an abstract of the total experience. Even when we are not concerned with a pictorial representation, still we may speak of 'images'; for once an idea is formulated in words or in some form of generalized speech, the word or speech representation is an image; and from the image arises the idea. Thus ideas not actually in consciousness are there potentially. They are said to be in the Unconscious with their associated feelings. This term, however, has a special meaning, given to it by the psychoanalysts. An idea may rise up into consciousness by some relation with a present mental process. A mental process is really a whole movement experienced by an individual, which can be viewed under different aspects, physiological, sensual, emotional, intellectual, moral. The Will directs by seeking one thing in consciousness and conditioning its linkage with another brought up by memory or otherwise into consciousness.

27. Willing, whether expressed by outward action or by mental activity, involves a conscious shifting of physiological energy. What the actual process is, we do not, and cannot, know. But it is clear that mental energy not only includes but is also in a grade above physiological energies, and is independent of them in so far as it directs them and is not alogether limited by them. This is another argument for the spirituality of the Soul.

28. We do not intend to imply that Values are varied arbitrarily. They are varied by keeping in consciousness, or 'paying attention to', one isolate rather than another, and by associating stronger feelings with the one rather than the other. The Will follows value, but it does not arbitrarily change reason into unreason. When a Government reckons on 90% of a tax being realised, it does not assume that there is

no free will, but only that a fairly definite number of people will associate more value with the payment of the tax than with its non-payment. Again, my will is not free to accept a fact or to deny it, I only attend to it or not; and this is not the same thing. That I submit to a show of force will signify that external submission is associated with more value than a struggle, and this submission may even be freely done. When external pressure or restrictions are such that a stupendous effort would be required to act in spite of them, then so far one's actions are *not* 'free.' Even the payment of a tax, or the raising of a hand to salute a Dictator's effigy, may not be free. It would be free if the action was consciously directed by the mind. In such a case, however, though the restrictions are internal, there is moral inability to overcome them, and there is no conscious directing in spite of full consciousness; also the Finis is almost wholly a negative one, viz., to avoid something undesirable, the Feeling of Fear being so strong that the mind could not shake itself free of it or dissociate it from the action. Such an action is "forced" by moral influence. Similarly we may have actions "forced" by other violent feelings, e.g. hatred, revenge, lust. A benignant judge may attribute it to 'temporary', 'insanity', or to being momentarily 'off-balance'. But many of these actions, although not immediately 'voluntary' may be voluntary in their roots inasmuch as the subject allowed these feelings to gain such a strong hold on him. The influence of alcohol also is such as to put certain passions beyond the subject's control; but his actions are voluntary or morally imputable to him inasmuch as he voluntarily indulged in the intoxicant. They are the more imputable if he had foreseen the results, and still more if he had indulged in drink precisely for this purpose, as, e.g. if a man drinks in order to 'prime' himself up to commit a murder. His "I did not know what I was doing" is not to be admitted as an excuse.

29. Willing is not manifest in every act of a man. Neither is a man always conscious. Nevertheless, in the same sense in which man has been defined as a 'rational animal,' he may also justifiably be described as An animal capable of consciously directing his conscious behaviour. If we should ask: How does the will direct an action, e.g. move the hand? How does the will pick out one particular idea out of the unconscious, as in Memory and Reasoning? Then we should only confound ourselves. For it is as if we considered the Will as a separate entity pressing a button or pulling a string or moving a lever to lift the hand, or diving into a store-room to pull out an idea. If one expects a visualisable mechanistic explanation, it is to look for something impossible and absurd. Scholastic Philosophy insisted upon the unity of man and the uniqueness of his Substantial Form, which one form is manifest in all his operations whether of a material, vital, physiological or psychological nature. It was by abstraction that the notions of Intellect, Will, Memory, etc. arose and gave rise to 'faculties', as if they were separate powers of different parts of the soul. The fact is that there is directive activity in man, consciously experienced and manifested. Behaviour is best considered and understood by abstractions, but we should beware of Fictions. Even in the "exact" sciences, we have had fictions, e.g. 'force'. Thus gravitation was at one time pictured as a stress and strain in something, the Ether. Words also lead one astray, e.g. 'property', which suggests ownership. We do not understand the How even in our studies of material things, and we are inclined nowadays to content ourselves only with the external facts of behaviour and different aspects of it. The progress of sub-atomic Physics has not solved the question, but only shifted it some degrees further. If I were asked how does body A act on body B, I should understand the interrogative to mean 'in what manner' and I should quote Newton's Laws of Attraction. If

the word meant 'by what mechanism', then I should be stumped. The theory of Relativity speaks now not of forces, but of gravitational fields, and science itself understands the word How to mean 'according to what law'. How much less can we expect to understand the How in regard to living things and to Man! Nor can we say how—*i.e.* by what mechanism—the soul informs the body. The question is absurd. More absurd is the question we are considering, for Will, as we said at the start, is only an abstraction.

30. As we ascend in the scale of being, inanimate bodies, plants, animals, man, we see that the restrictions of a lower state are overcome in the higher. The behaviour of the chemical elements and compounds of which a plant is composed, is directed in a manner that would not be 'natural' to them if they remained in their own level, the Mineral Kingdom. The behaviour of the vital parts of an animal is in a plane higher than those of a plant. The behaviour of Man manifests Willing and Thinking, over and above that of an animal. Chemical reactions in a plant cannot be predicted only from the study of dead matter; the peculiar reactions of an animal cannot be predicted only from the study of plants; the characteristic reactions of man cannot be predicted only from the study of animals. In addition, some reactions of a particular individual cannot be predicted from the study of all the rest.

31. There are restrictions in man arising from social influences on his modes of thinking, feeling, acting, e.g. education, prejudices, superstitions, respect for authority, customs, example, etc; but man can in general overcome all such restrictions. "You may lead a horse to water, but you cannot make him drink"; but a man will drink just to please you. He may even scrupulously pay up his income-tax. Man's mode of adapting himself to circumstances or his adapting the environment to suit himself, itself shows a directive activity not found in lower beings.

32. It must be noted, however, that thinking-feeling-desiring-acting associations once made are themselves restrictions to the directive activity of the mind ; and a man moved passively according to them is not at the moment acting freely, though he acted freely on a prior occasion.

33. Prof. H. Levy has attempted to explain the meaning of Free-will in his excellent little work '*Thinking*' as well as in his '*A Philosophy for a Modern Man*'. In the end, he explains variations in human acts as 'errors', or departures from the statistical or average law; and the Feeling of Freedom as the tendency 'to blame the departure from it on error'; only that we blame it on 'Free-will'. He compares the behaviour of individual molecules in a mass of gas to the behaviour of individuals in a society. We cannot predict the behaviour of a single molecule, but we can that of a mass of them; and even in a particular mass there will be variations from the average behaviour of a large number of masses. Levy is a champion of Materialism. He seeks to preserve the hierarchy of beings by recognising higher and higher 'levels of being' with higher and higher qualities, which according to him are only of a statistical nature and arise from the greater and greater complexity of things. In man's variations from the statistical average, Levy does not see any planning or purpose by the 'molecular' man. He considers a whole as made up of parts—hence with 'atomic' qualities—and at the same time as a member of a higher whole—hence with 'statistical' qualities. Thus if a marksman shoot a number of rounds at a mark, the shots are scattered; but it will be seen that there is a point about which there is greatest density and away from which the distribution gets less and less dense. Thus for each group there is a 'normal' and variations about it, and when all the shots of all the marksman are taken, this large group has its own normal and variations from it. Dr. Levy admits that purposive consciousness is

distinctive of human beings; but for him it is a group quality brought up by "the very act of seeing each fact and each experience in association with or in the environment of each of the others and of all the others". He adds: "In this sense also, it would appear, is conscious purposive-behaviour a quality of a higher and more complex level than the simple activity of inanimate matter." According to Dr. Levy, the basis of identification is that one quality, recognizably constant, serves to provide continuity between two states, while the other marks the discontinuity; and "in the last resort" Levy throws the blame on Society: "others accept the identity of the individual."

34. We may make several observations on the above. Levy confounds Freedom with Indeterminacy; for he attributes variation in behaviour of molecules to factors unknown to us and to the fact that nothing is perfectly isolated in reality. Elsewhere he tries to distinguish between them. If his Randomness is not the same as Indeterminacy, he does not define it clearly. It would be a sort of limited indeterminacy or a determinacy within bounds, and he treats it as a "factor" of an individual in a group. His randomness is measurable, and is obviously analogous to the Probability of Mathematics used in the discussion of individuals in a large aggregate. The comparisons he makes do not hold water. He considers Society as inevitable and independent in its form from man: whereas Society is a group shaped and structured by men conspiring to an end, the Common Good, *i.e.* for the sake of such values as are commonly held and are only or more easily attainable by united efforts. Society is, no doubt, a factor of uniformity in human behaviour. Levy's 'errors' or departures from the average are due just to Chance. He does not use this word, but neither does he give a sufficient explanation. The factor determining the centralization of the shots about a mark is the purpose of the marksman: those that make for variation are

the varying physiological and physical influences. Levy's 'explanation' of variation only amounts to a tautology: Individual men vary in behaviour from the 'average'. In regard to a person, Levy does not point out which quality is essential for continuity. Two distinct individuals may be identified if they exhibit some like qualities: Moreover the basis for the social acceptance of an identity is indeed a 'resort' later than Levy's 'last resort'.

35. Many others have tried to take the evidence for freedom from the manifestation of Choice, without analysing its nature, and confounding it with 'indifference'. I cannot choose if I am indifferent. Only by setting up one object as a Finis and not the other have I made a choice; the setting up was directed by myself; I attended to the desirability of the one more than to that of the other. Why? I would ask: Why not? My mind was not determined by either. To eschew the desirability of one was to overcome a restriction, and I overcame it. It is this freedom that gives an added indeterminacy to the actions of man. It may be said that it was the strength of my feelings and desires that determined my choice; but it was I that set up the Finis, put the means into relation with it, and directed the strength of my feelings; so that ultimately it was I that directed consciously the choice.

36. Suppose I place my hand carelessly on a hot iron. It burns me and I withdraw my hand with a jerk. The movements can be followed up scientifically. The iron stimulated, say, the terminals of certain nerve cells. They passed on the stimulus through axons to other nerve-cells or neurones, by a one-way system (the receptor or sensory nervous-system), till the stimulus reached the spinal-cord, along which it went on to the brain. Here it entered a complicated set of neurones. Then a stimulus passed outwards from this centre through the neurones, forming another one-way system (the effective or motor nervous-system), back to the hand;

as the result of which the hand was withdrawn from the iron. We may say that there is a 'way-in' to the mind and a 'way-out', and that we do not know what happens in the mind. But such a way of speaking itself leads one astray, for it implies that the mind is a sort of centre of communications situated in the brain, or a medium like the supposed ether subject to stresses and strains. The movement is a reflex-action common to lower animals; and the mind, properly speaking, does not direct the process; the only mental activity is the consciousness or the experiencing of acute pain. The hand was withdrawn automatically. However, a savage may suffer branding cheerfully; a Spartan hero thrust his hand into a brazier of burning coals; and a Christian martyr or a Hindu suttee welcome the cruel flames. In such cases the directive aspect of the mind is manifest. Associations have been formed by the subject itself, values created, fines set up. It is in the study of such cases that we find something peculiar to man.

37. That is why also it is so difficult to write History. Walter Raleigh, it is said, tore up his "History of the World" when he found that he and another differed in important details in an account of an incident that took place of which both were eye-witnesses. It is said we often see what we set out to see. Rather we should say that perceptions are influenced by associations for which in a great measure the subject himself is responsible. Attention is itself directed by the mind, by values connected with those already set up in the mind.

CHAPTER XX

RESPONSIBILITY

1. When we speak of moral causation, the notion of cause is not exactly the same as that of efficient cause. The will does not confer positive real being to any external thing. If John throws a stone, he has no doubt given transient physical energy to the stone, and so far he may be called an efficient cause. But the Mind as such does not confer any energy to the stone. It gives, however, to it ideal being: Vaiue, moral being, and Significance, intellectual being. Ideal being is a quasi-spiritual form of an accidental nature 'attributed' to the stone or to the action.

2. Just as efficient causation can be transitive, moral causation can also be transitive; so that each term in a series of cause-effects is a moral cause-effect deriving value and significance from the mind, inasmuch as each effect is an end intended by the person. There is a hiatus or break in the chain when we arrive at man. No spiritual being is communicated to the external world. The contact is a psycho-physical one. (In the case of Apprehension, where there is a physico-psychical contact, physical being or energy is received by the subject in the first instance, and is raised to the human level and then absorbed into the subject as accidental forms of the mind.)

3. Ideal being arises from Knowledge and Purpose, and is relative to the mind of the subject. It is not the same as spiritual being. There is no "interference" by the will with external physical natures.

4. The subject, the first term in the series of efficient causes, is thus a Moral Cause, giving the

series of efficient causes Value and Significance. He is an efficient cause in the sense of the rest; but also in a higher sense, inasmuch as of his own free nature he initiates and sets in motion a chain of efficient causes.

5. The subject is held to be responsible for an effect, *i.e.* liable to be called to account and to render satisfaction, when he is the moral cause of it. Even if he is not the moral cause but only a necessary condition to a causation, he is held responsible inasmuch as he knows and purposes to play this part, or even inasmuch as it is held that he ought to know and prevent the consequences. Thus by withdrawing my hand as a support I may let a stone drop on to someone's toes. I chop down a tree allowing it to fall on my neighbour's compound wall. A watchman is responsible for the loss of articles committed to his care, if, when he fell asleep, burglars made away with the goods. A railway company is responsible for accidents due to neglect of its permanent way. A treasurer is responsible for monies left in his charge.

6. In a series of cause-effects which a person has set going, the subject is primarily responsible for those which he purposed, secondarily for those which he foresaw but did not intend, and lastly for those which he ought to have foreseen by thinking and could have avoided. Each of us must have 'consideration' for everyone else.

7. Responsibility is attributed to a person by others; consequently, in so far as his actions affect or are likely to affect other human beings. The subject has a 'sense of responsibility' when he considers respect for the rights of others to be desirable, *i.e.* when he gives value to his neighbour's rights. It is the sense of responsibility that upholds a society. In society responsibility is measured by social standards.

8. That man has been held responsible in all ages and in all societies for his actions, is testimony to the universal acknowledgment of Free-will. But here also certain philosophers, moved by extraneous considerations, shelve the question. It must be noted that even those who disclaim responsibility for human acts according to theory and in philosophical discussions, are very different in their practical lives. No one holds a beast, bird, fish, insect, or plant, to be morally responsible for anything. Newton did not 'blame' his dog, through whose pranks, it is said, he lost many valuable records, the result of much patient labour and thought. It is we who direct the behaviour of domestic animals and train them to suit our own convenience. If anything goes wrong, we have ourselves to blame.

9. The heads of Governments, those who order our social life and direct our social outlook, have great responsibilities. In particular they are responsible also for the modes of thinking and feeling of the community, in spite of the fact that the individual is morally free; for social habits are great obstacles to freedom.

10. We are free and consequently responsible beings. In spite of external pressures moving or tending to direct our actions in one particular way, we can act in another way or refrain from acting—at least in our mental life. Such factors may move or direct one's actions to Good, but we may freely follow the Evil path; just as, in spite of factors directing one to Evil, we may freely pursue the Good. For this statement, it is sufficient to understand the terms Good and Evil in the social sense. Those who hold authority in a society must see to it that the factors present move the citizens in the good path. This is not the same as 'coercing' the citizens to be good. It is merely making it easier for them by removing obstacles to good and setting them up against evil. The worse the Government, the greater the Saints! We shall not

pursue this topic, as it pertains to Ethics and Sociology.

11. We have just mentioned social responsibility. But there is a responsibility to oneself. Each one has certain rights, natural and supernatural, e.g. the right to live, the right to healthy functioning, the right to exercise the mental 'faculties', also the right to one's supernatural end. Consequently one must respect these rights of oneself. This indeed is true self-respect. These rights are real, not figments of the mind, inasmuch as they are there whether we will or no, and whatever value we subjectively give to them. The sanctions for their observance, or the punishment for their violation, are to be had in the natural order of things as apart from the social order, e.g. disease, pain. With respect to the supernatural rights we may speak of this responsibility as 'responsibility to God', the sanctions being in the supernatural order.

12. When one has violated the social order there is a disordination in the mental content owing to a non-conformity with a moral plan. The Ego is not in moral union with its social environment. The feeling that arises is Remorse. This comes after the fact, But a similar feeling can arise in the very contemplation of the act before it is done, and this we may call Compunction. It may be so strong as to obstruct the act, so that the person refrains from doing that which would bring about the mental disorder. Even a desisting from action may bring about Remorse and the contemplation of such a desistence may bring about Compunction. (These feelings have reference also to the moral plan connected with the supernatural end of man.)

13. The actions of a person have Significance inasmuch as they are ordained to a Finis. When there is freedom then they have also an external or purposive Significance. The Finis is known by the

direction of the actions. Their purport becomes clearer, of course, if the Finis of the subject is known to the onlooker. They are put into relation with each other and with the Finis and reveal a Plan. A detective of crime seeks for a 'motive' in order to understand the deed and devise a method of investigation. If he can see no plan, he is perplexed. He discovers the plan only by analogy with himself and by sympathy. Thus only are the criminal's actions intelligible.

14. Remorse is allied to Shame, when there is exposure, actual or imagined, of that which one desires to hide or keep secret. Some sort of social ostracism is feared. One generally wishes to hide one's passions, when one realises that they are irrational or have displayed lack of control. Shame arises after the passion exhibited has subsided. Shame often arises, however, in anticipation of the display, and consequently is a check to it and to Exhibitionism. It is particularly connected with the display of the private parts; but it may arise in other circumstances, e.g. a display of a hole in a stocking or a rent in a dress.

CHAPTER XXI

INDETERMINACY

1. Sir Arthur Eddington in a broadcast address on Science and Religion, March 23rd, 1930, said: "So far as we have yet gone into our probing of the material universe, we cannot find a particle of evidence in favour of Determinism. There is no need any longer to doubt our intuition of "Free Will". Science has gone through such a glorious record of achievement only to arrive at what every Tom Dic

Harry acknowledges and has always acknowledged! It is a rare case of science coming round to the point of view of the common man. The latter would probably call it a fact of experience, and not a mere intuition, nor, as Sir James Jeans would have said, an innate conviction. Some scientists ignore the fact; and recently their successors, having lighted on an indeterminacy in the underworld of electrons and a plausible theory of probability and statistical behaviour in the place of Determinism to enable us to anticipate or predict the future with tolerable certainty and so to build up a world-picture, are at last willing to admit Free Will. Note that it is not because of a conviction based on experience, but because an elusive thing like the electron is unpredictable in its behaviour, and further because our agnostic and materialist friends will not grumble, for we do not attribute to the Will anything more than a property of elemental matter. Whether it will remain where it is or shoot off in one direction or another, we do not know! Nor would it matter, as the Theory of Probability can deal with its behaviour in the mass! This may give some consolation to the student of the masses. Some of our Dictators made themselves acquainted with the laws of mass behaviour and with methods of inculcating uniformity of behaviour. Unfortunately, the masses also enjoy a great deal of indeterminacy, or, shall we say, Fickleness!

2. We are perhaps justified in regarding the Mind as an entity really distinct from the body, because we find human behaviour not always explicable in purely mechanical or even physiological terms. But there is no such thing as a purely psychical explanation either. The isolates Mind and Body are mental conveniences and perhaps necessities.

3. Dr. C. E. M. Joad in his *The Mind and its Working* has well set out the point of view of the Materialist (including that of the Parallelist who

admits the possibility of thoughts and feelings being only mental reflections of disturbances in the brain or the body, and the Mind merely a recorder whose function it is to register or to be aware of events that occur in the body). He has set out also the alternative hypothesis that the mind is an active, dynamic, symthesizing entity of an immaterial nature. It is worth the while of the reader to go through that brief volume.

4. When we consider the manifestations of Mind, we are apt to speak of faculties, or of instincts, sensations, images, feelings, intellect, and will, as if they were distinct entities with distinct powers. When we say that in a certain behaviour a certain faculty is acting, all we can mean is that we take a particular aspect of that behaviour; *i.e.* we isolate from it mentally a particular view of it and from this view infer a potential striving in the individual. It is preferable to speak not of "faculties", but of mentally isolated modes of behaviour, which we mentally classify as emotional, intellectual, etc. It is quite possible—as experiments seem to indicate—that certain faculties are "seated in", meaning entirely dependent on, certain organs of the body. The invention of "faculties" may be traced to the abstractions of Scholastic Philosophy, and in particular to the multiplication of Forms in the school of Duns Scotus.

5. There is no such thing as a pure sensation in man. It turns out to be a highly complex affair in which the mind has a hand. There is no such thing as a pure image; it is always found associated with feeling. There is no pure feeling; it is always found associated with thought. There is no pure intellection; it is associated with feeling and willing. And there is no pure willing—the transitive verb always takes an object. Associations are made passively and actively. They can become habitual, but they can also be broken up by new circumstances as well as subjectively.

6. The Mind is not the mere sum of its ideas. These are accidental forms, adjuncts or contents. You may call the faculties by the name of tendencies; but they are active strivings. The Mind is itself a source of activity and is not merely receptive. Its very receptivity is brought into play by itself. It is the Mind that effects the contact between matter and mind, and the more free it is in this respect the more independent is it of matter and the more control also can it exercise over matter. The world can be a closed system not in contact with the human mind, as, *e.g.* when no human beings existed. So also can a human mind be a closed system not in contact with the external world. Cf., for example, Ecstasy in saints. That is why we are able to consider the world as unaffected by the mind of man, though the latter may be affected by it in the very consideration. In this sense all science claims to be objective. That is why also we can make the mistake of pure Materialism as well as of Subjective Idealism. Indeed, Mind is just one aspect of the human Substantial Form, which informs its matter, co-ordinating and subordinating and unifying all its energies and raising the whole to the level of Man, always operating in favour of the substantial unity, and manifesting itself accordingly. Mind may therefore be defined as the manifestation of the human Substantial Form in its highest aspects. So when we say that the Mind effects the contact between Matter and Mind, it must be understood as an abstraction. No biologist need take exception to this statement. It is at the root of all knowledge. The mind itself determines the contact with the physical world, and the phenomenon is Attention, the state of the mind being Consciousness. Even in the case of Memory and Imagination, it is mind that "calls them into play" by getting into contact with its store of sense-species. Just as I can straighten my forefinger, raise an arm or move my head without a knowledge of how it is done, so I can draw up a mental image. A Yogi controls not only his external muscles, but also

internal ones (it is said, even the muscles of his heart), so one can control physiological processes necessary for mental ones; and this control improves with training.

7. In the process of Attention, there is freedom to such an extent that man has always been conscious of it. This conviction is reflected in our language also. Any grudging recognition by some modern philosophers is belated, to say the least. Sometimes when tracing out causes we come to a full-stop at the human mind. If the mind be accepted as a separate spiritual entity, then the break in the chain of reasoning would occur even before that; for we could not explain the communication-reception between matter and mind, though we must accept the fact. Not only in the manifestation of the will but even in that of the intellect would the difficulty crop up. We cannot explain away choice and the freedom we experience. This would convince us that there is no object of experience with absolute value to draw the will inexorably to it and that would of itself so fully satisfy our cravings that the mind will quiesce completely and permanently in it. We are not drawn to an object by it alone. Someone has said that there can be a feeling of freedom without any actual independence of the will. But the fact of the universal conviction would itself require explanation; and, moreover, a universal illusion on this point alone is not to be admitted. Freedom is denied by a few philosopher from altogether alien considerations. (Miracles also have been denied by some from *a priori* considerations; and when they are confronted with a fact, either the historicity of the event is denied or the fact is put down as an illusion). Indeed, we claim that freedom is an objective or scientific fact, from its universal acceptance; and the more so because it has been experienced by all men, whereas some so-called scientific facts have been the privilege of only a few specialists working in laboratories, on whose word and authority they have to be accepted.

8. An Indeterminacy in the behaviour of an individual is our inability to predict what it will do next. Indeterminacy will arise in the following cases. Firstly, there may be a want of sufficient differentiation by which one individual may be distinguished from another in a set. It may be at times necessary for us to be sure we are dealing with one and the same individual and not confounding it with another, so that we may identify it in two situations as the same and follow out its career. The lower a thing is in the scale of being, *i.e.* the less complex its structure, the less distinguishable is it from another with the same kind of structure. In the most elemental matter in which we do not distinguish any parts, this sort of indeterminacy is to be expected. Even among the most elementary living cells with simple structures, we find it. Complex structures of the same kind are more easily differentiated than simple structures of the same kind. Secondly, there may be such a want of stability of each individual in its isolated substantial existence that it can enter into many states of higher unities, *i.e.* it is potential to several different states and to enter into several different combinations. This second sort of indeterminacy is, like the first, also found among molecules, still more among atoms, and most among electrons. It is found also, though to a much less extent, among living cells. Indeterminacy of the first and second sort are not had in the case of man. The only unities he is in potence to are moral not substantial ones, e.g. society. Thirdly, every individual in the set may be susceptible to the observation itself, react to it or be modified by the very tools of observation. This third kind of indeterminacy may also be expected in the ultimate constituents of matter, e.g. electrons. Technique will never be able to cope with the behaviour of the individual electron. This third kind of indeterminacy is also to be found in living things, but from an altogether different count; for their reactions are also internal, and their contacts are not merely physical but also

physiological; while in man, they are even psychological. Fourthly, indeterminacy will arise from our inability to observe each individual of a very large number separately, owing to present circumstances and to practical difficulties so great as to render observation morally impossible.

9. In all such cases of indeterminacy—which we may call for convenience respectively Indeterminacy of Structure, Indeterminacy of Potentiality, Indeterminacy of Susceptibility and Indeterminacy of Numbers, the only method of dealing with individual behaviour is the statistical one. We assume that individual behaviour is represented by the estimated average behaviour sufficiently for the purpose in hand, and that in the aggregate individual differences cancel each other. That there is consistency in the laws framed statistically, i.e. that the same results are repeatedly obtained from different experiments would show their objectivity and justify our assumption. In the case of electrons, we are justified by the consideration that individual differences can only be of a physical and quantitative sort, and that, moreover, in the mass there is dynamic equilibrium so that individual differences do cancel one another. The laws of Probability hold sway, the expectations being fulfilled in the mass. This may be true; but Probability is itself based on certainty and the degree of expectation is not calculated from the knowledge of the individual electron or of a system of electrons, but from our knowledge of the mass. No wonder then that the verification is perfect: Probability itself must be definite. Indeterminacy in the behaviour of the ultimate constituents of matter is not inconsistent with determinacy in mass behaviour. We shall observe further that determinacy in natural phenomena is not affected by human freedom, for men cannot alter the nature of things and the spirit of man cannot endow things outside it with spiritual being. We may direct the course of events in the material world, but only

according to its own laws and using its own energies. We may endow them, however, with intellectual and moral being, Significance and Value.

10. To the four sorts of Indeterminacy mentioned above, we may add a fifth: the Indeterminacy of Freedom. To confound indeterminacy with freedom and to concede freedom to man on the score of an indeterminacy in the ultimate constituents of matter is to disort the meaning of words. "Even freedom of man is not helped in any way by freaks within the atom" says Sir S. Radhakrishnan. "To suggest that electrons possess free-will is to degrade freedom itself." (*An Idealist View of Life.*) Dr. Brahma says: "If in order to be satisfied of the truth of freedom we want it to be proved at the level of mechanism, if instead of rising up to the level of freedom we desire that it may exist at the lower level of freedom, we are demanding nothing short of the impossible." (***Causality and Science.***)

11. The fifth sort of indeterminacy is of quite a different order, from the other four, which can be attributed to elemental matter, and even to living plant and animal cells. This fifth indeterminacy has reference to events of a different type altogether, and is in a different plane. The Mind has it in its power to determine itself; it enjoys a certain amount of independence in its orientation from the rest of the physical world. Differences among men are not merely of a physical and quantitative sort, and a social equilibrium is very different from a mechanical one; so that very often individual differences will not cancel one another.

12. Also Freedom is not the same as Indeterminacy. The latter word refers to knowledge by the subject knowing rather than to the behaviour of the object known. An electron is said to be indeterminate, because we have no means of knowing, as far as we have got, how it will behave the next instant.

We know, however, that it is behaving and is acting, and we presume its existence and activity the next instant. That it is free in the sense in which a spirit is free, is not assertable. It is absurd to say that there is nothing to influence its behaviour, or to determine its behaviour; for every single electron is reacting with all that it is in contact with, and absolute isolation of it from everything with which it may react is impossible. We are incapable of knowing all the influences acting on it. To say that it is "free" is to attribute qualities to it not found in it, to make up a fiction; to say that the human mind has only the "freedom" of the electron is to degrade the meaning of Freedom. Nor does it profit to say that an electron is mathematically an indeterminate differential equation; for we have only translated certain aspects of its behaviour into mathematical language. These aspects may show that the electron is indeterminate in the literal sense of the word, and may point out precisely wherein lies the indeterminacy. Every activity of the electron is directed to or refers to every other being. Its activity also implies its real relations with the world. In the case of the mind, there are ideal relations conditioning its activity, and these are set up by the mind itself. The objective establishment of several Laws of Nature would show that there is some determinacy, at least, in the world. Many predictions are actually verified.

13. That there can be a determinacy in the physical world in spite of an actual freedom of the Will is clear. For though man can move matter freely, *e.g.*, change the course of rivers, erect edifices, alter the geography or the climate of a place, yet physical nature may remain determinate. All that man does is to adjust contacts so necessary for causation; otherwise he does not alter the nature of things. Indeed, man is able to make these artificial alterations precisely because physical nature is determinate. If there were no determinacy, man would not

be able to plan for the future. Thus not only is determinacy in the physical world compatible with freedom in the mental world, but Freedom of the Will requires determinacy in Nature. Material things act according to their own natures, and man in his planning counts on their behaviour according to 'Laws' discovered by himself. Nevertheless, in tracing out a series of events according to their causal connections, we sometimes come to a full-stop in the will of an individual. The whole series is then a free contingent one, inasmuch as it originated in the Free Will of man. Such events are unpredictable; although, given the first, the rest may be foreseen.

14. "Like most other people, I suppose", said the late Sir Arthur Eddington, "I think it incredible that the wider scheme of Nature which includes life and consciousness can be completely predetermined; yet I have not been able to form a satisfactory conception of any kind of law or causal sequence which shall be other than deterministic. It seems contrary to our feelings of the dignity of the mind to suppose that it merely registers a dictated sequence of thoughts and emotions; but it seems equally contrary to its dignity to put it at the mercy of impulses with no causal antecedent. I shall not deal with this dilemma." (*The Nature of the Physical World.*) Eddington condescended at times to go down to the level of thinking of the ordinary man and to take a glimpse at the "wider scheme of nature" without a microscope or a telescope. The dilemma he speaks of does not exist, when it is borne in mind that generalizations by analogy or induction from the physical world may not include the Mind, and that the operations of any entity are proportionate to its own being.

15. Determinism is the doctrine that every event is determinate, or would be determinate if only we had full knowledge of the laws of nature and of the special circumstances. It is contained in the well-known lines:

"Yea, the first Morning of Creation wrote.
What the Last Dawn of Reckoning shall read."

16. In the XVI century there were heated controversies about Determinism and Free-Will. They were held to be opposed, and the latter was represented by its opponents as out of keeping with the Omnipotence and Omniscience of God. The controversy, started in the religious sphere, was continued in scientific circles. Scientific predictions, especially in Astronomy, and the discovery of greater uniformities in Nature, were acclaimed as establishing or at least supporting Determinism. Under the influence of Newtonian Mechanics, Determinism took a mechanistic trend. The Universe was conceived as a machine. Determinism became allied to Materialism. Some great scientists extended Determinism to the whole of nature, man included. Helmholtz, Lord Kelvin, Waterson, Maxwell, were all engineer-scientists. They were interested in reproducing and in making models. Their influence in Philosophy was enormous. Wohler produced urea in the laboratory, and it was soon found that not only organic matter but also living cells were made up of precisely the same chemical atoms as non-living matter. The conclusion was jumped to that living beings were governed by the same laws. The function of mind was only to respond to stimuli. The work of Huxley and Darwin in the field of biology favoured Materialism and Determinism, inasmuch as "factors" of evolution were enunciated. By the end of the XIX century, the Free-willers were beaten—almost. Only the plain man said: "Nevertheless, I am free". The end of the century, however, witnessed some astounding discoveries destined to swing the pendulum from Determinism to Indeterminism. The doctrine that every entity is fixed in being and in its mode of being, including its relations to other co-existents by the spatio-temporal reactions of all the pre-existents, must be rejected, not only because it leaves no room for the freedom of any one existent

not only because it does not take into account the dynamic equilibrium of energies, the play of active and passive potentialities at the instant under consideration, but also because such a Determinism is too far-fetched and is against all experience.

17. Determinism is "based on the assumption that if we know everything in space at any given time, we should know everything in time in any given space". (Levy: *Thinking*.) It is pure fantasy. Scientific theories and predictions are made with the knowledge and experience gathered up to that point only, not with imaginary knowledge and experience. The doctrine is akin to Fatalism in human destinies and to Predestination, and is fundamentally opposed to the Christian doctrine of Freedom and Responsibility. Fatalism is a tenet of Islam; Predestination is due to Calvin. Man has interfered with the operations of natural forces; he has changed the courses of rivers, he has denuded forests and thus affected rainfall and climate; he has joined together oceans; he has built cities, and in general adapted his environment to his needs and fancies. Events in which the operations of man's will enter, can certainly not be predicted in the same way as those in which it does not enter. The human entity can be to a notable extent a Free Cause. An Absolute Determinism is indeed a gratuitous assumption altogether unjustified, and raising up great difficulties. Nowadays, Eddington observes, as a consequence of the advent of the Quantum. Theory and of the acceptance of Heisenberg's Principle of Indeterminacy, "Physics is no longer pledged to a scheme of deterministic law". These theories are, however, mathematical abstractions and the statement should be taken with a grain of salt. Neither was Physics at any time subject to any deterministic scheme when free interference by man was involved.

18. Calvin thought that Free-will was not consonant with the Omnipotence and Omniscience of the

Deity. The concepts, however, are not opposed. Not only is human freedom consonant with Divine Omnipotence, but it would also make us appreciate better that divine power and goodness which endowed man with this divine spark. Human freedom is by no means absolute; it is not a freedom from any constraint whatever, an immunity from all external and internal antecedent conditions and limitations. It is a freedom within limits,—limits of its own nature and circumstances. It is a liberty of exercise to act in this particular way or not, the particular way being possible to itself. It is not a liberty to act or absolutely refrain from acting. It is a liberty of specification: to do this or to do that, either one or the other being possible to the nature of man itself. That God can impart such a freedom to a creature is by no means absurd. It does not import any absolute independence from God in the creature, for the latter is in essence, in existence, and in operation, dependent on God's endowment. Moreover, the will as a cause communicates no real being but only moral being, viz. significance and value to its external effects, so that it cannot be an efficient cause of them. As regards the internal effects of the mind or ***motus ab intrinseco***, we may say briefly: the sensible-species, purely physiological reactions to external pressure on the organs of sense, have no spiritual nature and cannot cause those accidental forms of the mind called Ideas, unless they are themselves in the first instance imbued with spirituality or raised to the psychical level by the mind itself and become intelligible species, which are then taken into the psychical being. Man is a living substantial unity belonging at once to the material order as well as to the spiritual order, and not an integration of two parts acting in correspondence with or parallel to each other, or with causal connections other than those of Matter and Form. The very entering into consciousness of sensible impressions is the experiencing of the causal process by which accidental spiritual being is given to them. Is it surprising that our very ideas partake at one

and the same time of the dual nature of man ? We surely know it by dependence of thought or even consciousness itself on our material make-up. It must not therefore be taken as absurd that material entities should have accidental forms of a higher plane of existence, and that these should be given to them by a being belonging substantially to both the orders and in whom those material entities have their existence ; for the sensible impressions have their existence in and through the composite unit, man.

19. In general the *range of freedom* of the Will is limited to the internal content of the mind and to all the vital reactions of the individual. The mental content grows up from childhood. It is a strange paradox but true that the range though continually extending is also being narrowed. The mind is like a conqueror extending his territory but neglecting larger and larger portions of it and keeping up his interest only in a portion over which he can personally exercise absolute sway. We must not lose sight of conditioning circumstances both of external and internal origin. Physiological reactions to external stimuli, periodical changes and feelings, these play their part in the adjustments within the individual, besides the associations already established within the mental content. Those parts of the content which are immediately oriented towards the Ego have value. Value, as we have said, is variable, but its basis is reality. The will cannot set up anything whatever as a finis. The thing must be such as to be unifiable with the Ego. Again, the associations already formed in the mind are restrictive. They have been set up by the direction of the will, at least by Acquiescence. The fetters with which the subject ties himself up are imposed by himself. These hindrances and limitations can indeed be removed by the subject himself. But when he breaks up one bond, he forms another, and to overcome restrictions needs great effort every time. Fortunately, such restrictions are useful also ;

for by them we have habits : of reasoning, of expressing ourselves, of acting. If for every act of ours we need an effort of the will we should all collapse of exhaustion in a very short time.

20. A physical unification of myself with the world with which I am in contact, is impossible and absurd. A psychological union is possible to some extent. There can be some intellectual unification of the mental content, *e.g.*, Science. There can be also some moral unification by Love of Nature and particularly of our neighbour. A neighbour is any other human being with whom I am in any sort of contact. Without such a unification we are faced with disaster, both in our individual as well as in our social lives, a disaster which would threaten the very destruction of the whole race.

21. Descartes rightly laid the difficulty of reconciling human Freedom with divine Omniscience at the door of human frailty or finite intelligence. The difficulty may be worded thus. Whatever God knows He wills. God knows everything. Therefore He wills everything. Hence there is no place for human freedom. Or thus: If man is free, he is independent of God. Then God would not be God. All we can know of the Mind of God is by analogy with ourselves, removing those defects and limitations to which we are subject. If God's existence be taken as a primary postulate, insuperable difficulties crop up at once. If, however, causality and some degree of freedom are firmly established, and the existence of God deduced therefrom, then the difficulty of reconciling the notions may be evaded in the Cartesian manner; or better still, failing an attempt to comprehend these notions—for comprehension is certainly needed for their reconciliation—we may show that the notions are not contradictory, and that both, having been objectively established, can be held side by side. In this connection may well keep in mind

what we have said above concerning the limitations to human freedom, the compatibility of freedom in the moral sphere with determinacy in the physical sphere, and the distinction between 'consequent' and 'antecedent' necessity. It must be noted also that our freedom is willed by God and our actions are upheld in their freedom by God himself. We have said also that the Will is free of certain material restrictions, but we have not said that it is independent of God; for in being and operation it is absolutely dependent on the Creator. God foresees what man freely chooses, and His willing is consequent to the foresight, and not antecedent to it. (We may make such distinctions, but they are all mental abstractions.) However, God does not know things by apprehension, perception, and discursive reasoning, as we do. Since our knowledge is only of this type, we are unable to understand the divine Mind.

22. Indeterminism is the doctrine that the indeterminacy found inherent in the ultimate constituents of matter remains in the bulk; that we can, therefore, only deal with behaviour of matter in the bulk in terms of probability; and that the freedom of the Will is of the same nature as the indeterminacy of matter.

23. We have already distinguished five sorts of indeterminacy; or rather we have given five reasons for indeterminacy. We have indicated also that greater and greater indeterminacy is to be expected as we go lower and lower down in the scale of being. On the other hand, individuation and determinacy are of a higher and higher type as we get up the scale of being. The Indeterminacy of Freedom is altogether of a different type and also in a different plane. Moreover, the doctrine of Indeterminism involves Atomism, inasmuch as it expects an explanation of a whole from a consideration of its parts only. It implies also a denial of substantial unities and of energies higher than physical ones.

24. Freedom is sometimes taken to mean the same as liberty, an immunity from constraint. We prefer to give a special meaning to the word. It is not an immunity from constraint; in fact, Freedom, as understood by us, assumes constraint. It is the conscious power over constraint, When a thing is said to be free, the two senses in which this statement may be taken must be borne in mind. When the will is not acting, there is no attraction or repulsion in the object of thought; the attitude of the mind is indifference. Indifference corresponds to liberty. To freedom corresponds Choice. Liberty is a negative concept; Freedom is a positive one. With Choice there is mental activity and effort; with Indifference there is none.

25. Necessity of Compulsion or Coercion is opposed to both Freedom and Liberty. It is a determination in behaviour by some pressure, external or internal. Under external pressure of physical force a man behaves as a physical entity only. Internal pressure may be of several kinds, *e.g.* habits, emotions, desires. A person acting under necessity is, therefore, not free, at least with regard to his external behaviour. Even his will may finally be "broken", *i.e.* cease to appear when the strain involved is too great to bear.

26. Contact is necessary for causation as a *sine qua non* condition to it. Man has some control over the contact of the world with himself. Also he can direct to some extent his own physical energies and so control the contacts of material things one with another. Thus there can be free-events in this world; indeterminate, because man's will is involved.

27. XVII century philosophers looked for some sort of connection between body and soul, matter and spirit. A logical nexus is absurd, as the concepts are opposed. A physical connection is equally absurd. The connection, nevertheless, is real or entological.

The soul in a special function is the Substantial Form of the body, which it vivifies and unifies in its essential being, and in and through which it acts and manifests itself. In spite of this connection, however, its spirituality is obvious from the freedom—though limited - which it enjoys. The nexus is in the nature of real relations of actuality.

28. The objection to Freedom, as given by Materialists may be stated in the words of Prof. J. C. Crowther (*An Outline of the Universe*, Vol. 2) : " There is strong temptation to accept the opinion of those who believe that personality is directed by a free-will. If this were true the operations of the brain, in so far as they were a correlate of intelligent behaviour, would be for ever inscrutable, since it is necessarily impossible to discover the laws governing a lawless will. In fact, if the will were free it is difficult to see why brains should exist. An organism possessing free-will can have no use for any mechanism in the control of its behaviour, because its behaviour is uncontrolled. If behaviour were free and above control no control centre and therefore no brain would be necessary."

29. No one can overlook the fact that he experiences free-will. No one can honestly assert that he was never conscious of directive activity in any of his acts, that he did not at times have a sense of responsibility and that he never blamed another person. Free-will is a fact; an objective fact, because it is accepted by all men, of all places, of all centuries—no matter whether it was discovered by introspection, by analogy with the self, and by interpretation of others' acts.

30. The determinist attempts to get out of a dilemma by calling it an " illusion ", which, he will concede, he himself has had at times. The existence of such a general illusion, its persistence and impressiveness, is rather astounding. Calling it a bad name, or decreeing its banishment, does not alter its being a fact. Why and

how such a universal illusion, on such an important matter, affecting our behaviour and even happiness, came to be, need answering by the determinist. No proof has been devised to demonstrate that freedom is an illusion. Indeed, no satisfactory explanation of human behaviour has ever been given when this fundamental fact was neglected. The denial of free-will is a most convenient assumption to a delinquent. A philosopher can only be a determinist if he shuts his eyes to this obvious fact ; he takes his determinism as a postulate and then believes he has proved it. He firmly believes that the chain of efficient causes can never be broken, and thinks he has ostensibly proved this by choosing his facts and setting down other facts as illusions—and he claims to be scientific! The immediate evidence of common experience cannot be shaken by prejudices. The determinist puts himself into a dilemma by accepting determinism, and he chooses an unscientific way of getting out of it, ignoring an important set of objective facts for this purpose, claiming to be scientific precisely in virtue of his being unscientific. There is no justification for the deterministic postulate ; and there is no need for it, because other ways of causation need not be overlooked.

31. The vigour and the variety of the attempts recently made to whittle down the notion of Freedom to zero by confounding it with indeterminacy and even attributing it to the electron, would themselves show the overwhelming nature of the evidence for the fact. They were very subtle, but could not convince any body, not even those who made them.

CHAPTER XXII

HYPNOTISM

1. Mesmerism had drawn the attention of the medical world at the end of the previous century. The theory of a "magnetic fluid", the mystical and often immoral practices of mesmerists, and the rejection of their claims by medical bodies, brought mesmerism into disrepute. In the middle of the last century, it rose again, shorn of its superstitions, objectionable practices and mystical theories, at the hands of Abbe Faria and James Braid, under the title of Hypnotism and began to be utilized in the treatment of neuroses. Soon it came into prominence.

2. The patient is firstly made to recline or sit easily. There should be no muscular tension or strain. His mind also must be at ease: worries and disturbing thoughts must be put away. The directions of the hypnotiser should be easily followed. The second step is to immobilise the attention.

3. The subject is asked to fix his gaze on some small object, e.g. a shining button, or a light, suspended a little distance away above the level of his eyes; or revolving mirrors; or he may be required to stare into the eyes of the hypnotist; or to listen to some monotonous rhythmic sound, e.g. the ticking of a watch or clock. Sometimes "passes" (regular, slow downward movements by the hands with fingers stretched out) are made in front of the subject's face and head. When the ocular nerves are wearied, the eyes close and the subject passes into hypnosis. He gradually falls into a drowsy or lethargic state, like that preceding or following on natural sleep. From this state of trance, he is awakened by blowing into his face or by making passes in the reverse direction, i.e. upwards.

4. The trance may be of different degrees of intensity, from a mere drowsiness to a deep

somnambulistic sleep. It may take a considerable time or several sittings before a subject is put to sleep.

5. In the milder forms, the subject is quite aware of what is going on about him, and can remember the various incidents afterwards, though he perhaps feels somewhat drowsy. He is in a condition of *rapport* or special relation with the hypnotiser, susceptible to the suggestions of the latter. In the deeper stages, he loses connection with all objects except the hypnotiser and his suggestions. When he awakes, his recollection of the incidents in the hypnotic state are very faint.

6. Hypnotism was adopted as a method of treatment chiefly in Paris and Nancy. Dr. Charcot (1825-1893) introduced it in the Salpetriere Hospital at Paris. He was the leading neurologist of the day, a dominating personality and an able teacher. He exercised a great influence in the sixties, seventies, and eighties, and had many distinguished pupils. The rival school of Nancy was under Drs. Bernheim, Liebault and Beaunais. Bernheim and his physicians used only simple suggestion. After the patient was seated comfortably and relaxed, the doctor would say in a quiet firm voice: "Gaze fixedly at me, and think only of falling asleep....You feel your eyelids heavy....You are very drowsy....Your eyes grow dimmer and dimmer....Your eyes are closing....You cannot open them....Sleep."

7. Charcot defined three stages of the hypnotic trance: cataleptic, lethargic and somnambulistic. (Wundt, who was also interested in hypnotism, characterised them more simply as drowsiness, light sleep and deep sleep.)

8. The remarkable phenomena are of great interest to the psychologist.

9. Catalepsy means a corpse-like rigidity of the limbs or body. The subject's body may become so rigid that it can be supported with the neck on the back of one chair and the heels on that of another, with no apparent effort on his part. Or he may be unable to open his eyes or to speak or to move a limb. If he is told to hold out an arm and then assured that it is impossible to withdraw it, it will remain stretched for a much longer period than it could be by his voluntary effort when in the normal state.

10. Lethargy means a deep sleep-like state. The body is motionless like a log.

11. Somnambulism is a state of activity while, as it were, asleep. The subject will walk, talk, etc., and is most susceptible to suggestions. It has been claimed that blisters or burns may appear at the mere suggestion that a piece of chalk in his hand is a burning coal. Illusions can be induced—of cold or warmth, of the presence of objects in the room, of age or of childhood, of another personality—even "negative" illusions, as, e.g. that a certain member of the company is not there. He can be made to do what in his normal state he will see would lead to ridicule, or be absurd or unpleasant. Just as one or two of his senses can be put out of use for the time, so also they may become extraordinarily acute. Certain areas of the body can be anaesthetised or rendered insensitive to pain or pressure. The subject may forget altogether some part of his life or some aspect of it; he remembers well only such of his experience as is appealed to by the hypnotiser. His sense of time and duration may be extraordinarily precise.

12. These phenomena may be put under the following heads: susceptibility to suggestion, inhibition of the voluntary muscles, lowering or sharpening of sensibility, dissociation and suppression of experience, illusions and hallucinations.

13. There are two still more remarkable phenomena, known as amnesia and deferred suggestion, in deeper forms of the hypnotic trance. When awakened, the subject cannot recall the incidents that have just happened; nevertheless, he remembers them quite well when he is put into a hypnosis again. Again, he does not remember having received any orders while in a trance; nevertheless, he executes them as if he had thought of doing them himself; and he does them punctually at the time prescribed by the hypnotist. He feels a craving, an inexplicable impulse, at the right time to set about his task. If he is thwarted, he may fight desperately against opposition or even succumb to a fit of violent convulsions.

14. The therapeutic value of hypnotism in Medicine and Surgery is certainly not negligible. "On the other hand—says Dr. Axel Munthe in his *The Story of San Michele*—it is immense if in the hands of competent doctors with clear heads and clean hands, and thoroughly acquainted with the technique". Dr. Munthe found himself "compelled to make use of this weapon when other remedies had proved useless." "Mental disorders of various kinds with or without loss of will-power, alcoholism, morphinomania, cocainomania, nymphomania, can, as a rule, be cured by this method. Sexual inversion is more difficult to tackle." "Specialists in nervous and mental disorders can no more do without hypnotism than can surgeons without chloroform and ether. One need only remember the thousands and thousands of helpless cases of shell-shock and traumatic neuroses during the last war cured as by enchantment by this method." Speaking of a sexual invert to whom he did some temporary good by hypnotism, but who subsequently killed himself, Munthe says: "Had this unhappy man consulted me a few years later, when I had acquired more knowledge of sexual inversion, I would never have attempted the hopeless task of curing him." "The great benefit from hypnotic anaesthesia in surgical

operations and childbirth is now admitted by everybody. Even more striking is the beneficial effect of this method in the most painful of all operations, as a rule still to be endured without anaesthesia—Death." Munthe describes how in the autumn of 1915 he helped some hundreds of dying soldiers to their end, "often even with a smile on their lips."

15. Mild hypnoses generally suffices. "An operator well acquainted with its complicated technique and who knows something about psychology—both these qualifications are necessary for success—will as a rule obtain remarkable, often amazing results, by the mere use of what is called ***suggestion a l'etat de veille.***" By hypnosis certain symptoms, e.g. vomiting, can be stopped, so as to give time for a certain drug to act or for the constitution to restore itself.

16. Dr. Munthe writing in 1928 (***op. cit.***) says: "The famous platform performances in the amphitheatre of the Salpetriere which brought on my disgrace, have since long been condemned by every serious student of hypnotic phenomena. Charcot's theories on hypnotism, imposed by the sheer weight of his authority on a whole generation of doctors, have fallen into discredit after having retarded our knowledge of the true nature of these phenomena for over twenty years. Almost every single one of Charcot's theories on hypnotism has proved wrong. Hypnotism is not, as he said, an artificially induced neurosis only to be encountered in hysteria, in hypersensitive, weak-minded and ill-balanced people. The contrary is the truth. Hysterical subjects are as a rule less easily hypnotizable than well-balanced and mentally sound people. Intelligent, strong-willed and domineering people are more easy to hypnotize than dull, stupid, superficial, weak-minded people. Idiots and lunatics are in the majority of cases refractory to hypnotic influence. People who say they don't believe in hypnotism, laugh at you and say they are sure they

cannot be hypnotized, are as a rule most easy to put to sleep. All children are easily hypnotizable. Hypnotic sleep cannot be produced by mechanical means alone. The shining glass balls, the revolving mirrors borrowed from the bird-catcher, the magnets, the fixed staring in the eyes of the subject, the classical mesmeric passes used at the Salpetriere and the Charite are sheer nonsense."

17. "To me who for years had been devoting my spare time to study hypnotism these stage performances of the Salpetriere before the public of Tout Paris were nothing but an absurd farce, a hopeless muddle of truth and cheating. Some of these subjects were no doubt real somnambulists faithfully carrying out in a waking state the various suggestions made to them during sleep—post-hypnotic suggestions. Many of them were mere frauds, knowing quite well what they were expected to do, delighted to perform their various tricks in public, cheating both doctors and audience with the amazing cunning of the hysteriques".

18. "Outside the Salpetriere I have hardly ever come across Charcot's famous three stages of hypnosis so strikingly exhibited during his Tuesday lectures. They were all invented by himself, grafted on his hysterical subjects and accepted by his pupils by the powerful suggestion of the Master. The same affirmation holds good in regard to his special hobby, his *grande hysteria*, then rampant all over the Salpetriere ward after ward full of it, now almost extinct. The fact that all these experiments in hypnotism were done on hysterical subjects, is the only possible explanation of his inability to understand the true nature of these phenomena. If the statement of the Salpetriere school that only hysterical subjects are hypnotizable was correct, it would mean that at least eighty-five per cent of mankind was suffering from hysteria."

19. In Paris, the theory prevailed that hypnosis was a nervous phenomenon, a kind of hysteria, found only in hysterical patients, to be looked upon as essentially a physiological phenomenon. Dr. Bernheim and the physicians of the Nancy school maintained that hypnosis was mainly a psychical phenomenon, a state of Mind or Soul, that it could be induced by suggestion, and that its essential characteristic was suggestibility. This later led Emile Coue to his 'Art of Auto-suggestion' by which one can work marvellous cures or changes for the better in oneself. The Nancy physicians ordinarily induce the hypnosis by simple suggestion of the idea. They have not come across such amazing cases as reported from Paris. They teach that mild hypnosis is only a passive and receptive state produced by suggestion, and that it can be induced in nearly all normal subjects. They maintain that hypnotic sleep and natural sleep are identical. "It is not so", says Munthe. "As yet we do not know what hypnotic sleep is, and until we know more about it, we had better refrain from inducing it in our patients except in cases of absolute necessity". "On one point", says Munthe, "Charcot was surely right, whatever the Nancy school, Forel, Moll and many others may say. Experiments on hypnotism are not without their danger, to the subject as well as to the spectators. Personally I think public demonstrations of hypnotic phenomena should be forbidden by law." They are now forbidden by law in most countries. Charcot recognised a danger even to the hypnotizer.

20. Wundt (*Lectures on Human and Animal Psychology*) says: "Hypnotism as a therapeutic agency is a two-edged instrument. If its effects are strongest when the patient is predisposed to it in body and mind, or when suggestion has become a settled mode of treatment, it may obviously be employed to intensify or actually induce a pathological disposition. It must be looked upon, not as a remedy of universal serviceability, but as a poison whose effect may be

beneficial under certain circumstances. (Some assert) that the hypnotic sleep is not injurious, because it is not in itself a pathological disposition. But surely the facts of post-hypnotic hallucination and the diminution of the power of resistance to suggestive influences, furnish a refutation of this statement which no counter-argument can shake. It is a phenomenon of common observation that frequently hypnotized individuals can, when fully awake, be persuaded of the wildest fables and thenceforth regard them as passages of their own experience."

21. The percentage of persons who can be hypnotized is stated variously by different authorities. Charcot maintained that only hysterical people were hypnotizable. This is not accepted nowadays. Bettey gave the figure as 30%, Morselli 70%, Delboeuf 80%, Bernheim and Forel also put it down as 80%, Munthe as 85%. Some say that all purely normal people are hypnotizable—always subject to their own consent and to the co-operation which they accord to the hypnotist.

22. It has long been known that even insects, birds and animals can be hypnotized. Dr, Munthe seemed to have extraordinary power in hypnotizing not only men but also snakes, lizards, tortoises, parrots, owls and other birds, big cats and monkeys. He opened an abscess and extracted a splinter from the paw of a lioness, and attributes his success to "local anaesthesia under slight hypnosis".

23. Of the dangers of hypnotism, Dr. Munthe is fully aware; nevertheless, he says: "Most of the accusations against hypnotism are grossly exaggerated. So far I know of no well authenticated proof of a criminal act committed by a subject under post-hypnotic suggestion. I have never seen a suggestion made under hypnosis carried out by the subject which he or she refuse to carry out if made during normal waking state. I affirm that if a blackguard should

suggest to a woman under profound hypnosis that she should surrender herself to him, and she should carry out this suggestion, it would mean that she would as readily have done so had the suggestion been made to her in a normal condition of waking life. There is no such thing as blind obedience. The subject knows quite well what is going on the whole time and what he is willing or unwilling to do. Camille, Professor Liejoie's famous somnambulist in Nancy, who would remain impassive and indifferent when a pin was stuck full length through her arm or a piece of burning charcoal put in her hand, would blush scarlet when the Professor pretended to make a gesture as if to disarrange her clothes, and wake up instantaneously. This is only one of the many baffling contradictions familiar to students of hypnotic phenomena and most difficult for the outsiders to understand. The fact that the person cannot be hypnotized without his or her will, must not be overlooked by the alarmists. Of course all talk about an unwilling and unaware person being hypnotized at a distance is sheer nonsense. So also is Psycho-Analysis."

24. Regarding the theories of hypnotism, it is worth quoting once more from Munthe. "What was this mysterious force which almost seemed to emanate from my hand? Where did it come from? Did it come from the stream of consciousness within me below the level of my waking life, or was it after all the mysterious "odylic force", the magnetic fluid of the old mesmerists? Of course modern science has done away with the magnetic fluid and replaced it with a dozen new, more or less ingenious theories. I know them all; none of them satisfied me so far. Suggestion alone, the very keystone of the new universally accepted theory of hypnotism, cannot explain all its startling phenomena. The word suggestion as used by its chief promoters, the Nancy school, differs besides only in name from this new ridiculed odylic force of Mesmer. Let us admit, as we must do, tha

the miracle is not done by the operator but by the subconscious mind of the subject. But how are we to explain the success of the one operator and the failure of another? Why does the suggestion of one operator re-echo as a word of command in the subterranean workshop of the subject's mind to bring its hidden forces into action while this same suggestion made by another operator is intercepted by the subject's consciousness and remains ineffective? I, of all people, am anxious to know it, because ever since I was a boy, I have been aware that I myself possessed this power, whatever name is given to it, in an exceptional degree. Most of my patients, young and old, men and women, seemed to find it out sooner or later and often spoke to me about it. My comrades in the hospital wards all knew about it. Charcot himself knew about it and often utilized it. Professor Voisin, the famous alienist of Asile St. Anne, often made me assist him in his desperate endeavours to hypnotize some of his lunatics. We used to work for hours with these poor lunatics screaming and raving with rage in their strait-jackets, unable to do anything but to spit in our faces, as they often did. The result of our efforts was in most cases negative, but on several occasions I succeeded in calming down some of them when the Professor himself had failed, notwithstanding his marvellous patience. All the keepers in the Jardin Zoologique and Menagerie Pezon knew about it. It was a familiar trick of mine to put their snakes, lizards, tortoises, parrots, owls, bears and big cats into a state of lethargy, quite similar to Charcot's first stage of hypnosis, often I even succeeded in inducing profound sleep. I think I have already mentioned how I opened an abscess and extracted a splinter from the paw of Leonie, the magnificent lioness in the Menagerie Pezon. It could not be explained but as a case of local anaesthesia under slight hypnosis. Monkeys, notwithstanding their restlessness, are easily put to sleep, thanks to their high intelligence and impressionable nervous system.

Snake charming is of course a hypnotic phenomenon. I have myself put a cobra into a state of catalepsy in the temple of Karnak. The training of wild elephants has, I suspect, also something to do with hypnotic influence. The way I once heard a mahout talking for hours to one of the elephants of the Zoo who had become restive, sounded exactly like hypnotic suggestion. Most birds are easily hypnotizable, everybody knows how easily it is done with chickens. In all dealings with animals, wild and tame, the soothing influence of the monotonous sound of slowly repeated words can easily be verified by every observer, so much so that it almost seems as if they understood the very meaning of what one said to them—what would I not give if I could understand what they said to me! Still it is obviously impossible to speak of mental suggestion here. There must be some other power at work, I ask again and in vain, what is this power?"

25. Charcot had many pupils who earned great fame in the treatment of neuroses. Pierre Janet (b. 1859) who rose to prominence at Paris continued to use hypnotism for the treatment of hysteria. He found that an hysterical patient could recall past events under hypnosis, which normally he could not remember; and, in particular, he could fully describe some emotional shock which was quite forgotten in the waking state. Moreover, he could be made to overcome by suggestion the hysterical symptoms connected with the shock. Janet grouped all types of neurosis, *e.g.* phobias and obsessions, under the name of psychasthenia, and attempted to overcome them by "re-educating" the patient. He attributed neurosis to a lowering of mental tension by which the subject could not summon sufficient energy of will and action to overcome difficulties. So that the general feeling of insufficiency would give rise to neurotic fears, obsessions, paralyses, etc. Janet recognised unconsious mental activity, to which he gave the name mental automatisms. Janet spoke of neurosis as an expression

of weakness. The fundamental weakness of the neurotic was a low mental tension, experienced by the subject as a feeling of inadequacy. Out of this feeling the particular phobia or obsession grew as an interpretation by the subject of his own weakness.

26. The eminent biologist A. R. Rivers of Cambridge University considered hypnosis as a natural instinctive state. He compared it to certain normal reactions of animals in the presence of danger, *e.g.* a chicken at the warning call of the mother when an eagle hovers above, lies prone on the ground. The reaction often takes the form of immobility. This is so even in a herd of animals or flock of birds acting collectively almost in perfect harmony in the presence of danger. They move or become immobile under the influence of sympathy and sense-suggestion. In flight a flock of birds seem to manoeuvre with one accord. Again, a group of well-disciplined soldiers at an outpost in time of war will, when suddenly warned of danger, exhibit a similar sort of collective hypnotism. The attention of each is immediately fixed or immobilised; his sensibility is heightened; he is in rapport with his officer or with the one who has taken the lead, awaiting his signal, in complete harmony with his will, and obeying at once, as if instinctively, his slightest sign; he is very suggestible, and the command is almost intuited before it is given. He sees and hears better than at ordinary times; he forgets or suppresses any feelings or memories that would interfere with the job on hand. His experience is thus dissociated. He may be said to be under the hypnotic spell of his leader, being so entirely under his suggestion and oblivious to all else.

27. Many explanations have been given of hypnotism. The hypnotic state has been likened to intoxication or to anaesthesia or to ordinary sleep. However, the heightened sensibility and susceptibility to suggestion as well as the rapport between subject

and hypnotizer sufficiently differentiates it from these. There may be some physiological resemblance, however, between hypnosis and sleep. One theory of sleep—we know very little about it, in fact—is that it is due to a disjunction of the nerve terminals at synapses. The nerve fibrillae usually end in fine branching structures (like many twigs off a branch or capillary roots off a root). These "branchlets" of one nerve-cell intertwine among those of the fibrillae of other nerve-cells, without coming into actual contact with them. The nerve-cell is said to arborise, *i.e.*, spread out by branching like a tree. A neuron is the complete nerve-cell, *i.e.*, the axon and its dendrites, including all the branchlets. The mutual intertwining without contact of the arborisations of the fine nerve fibrillae at the point where one neuron passes on its nervous impulse or energy to another is called a synapse. When this is impeded, there is disjunction. Then there is no longer constant communication between the association centres of the brain. "Messages" would pass with difficulty or not at all. The physiological counterpart of thought would not be a continuous process. There would be gaps in the associated succession of images. There would be no active directing of thought-processes. There would be no "imageless thoughts", Thinking would be only a flow of images, or at the most, it would follow habitual lines inasmuch as these have become dependent on habitual physiological processes. This theory is merely guess work. More facts have to be collected about the physiology of sleep; and experimentalists have much scope for original work in this direction. The theory outlined above was most in favour over a generation ago. Perhaps the right clue to the problem is the "soothing influence" of monotony mentioned by Munthe in the passage last quoted.

28. The experiments of Pavlov, the Soviet physiologist, on dogs have thrown some light on the nature of sleep as well as on hypnotism. Having reduced

all behaviour to reaction to stimulus, and reaction to two types, excitation and inhibition, so that behaviour is only a combination of these, he invented a technique for measuring some of these reactions and for establishing and extinguishing conditioned reflexes. An inhibition is an interception or obstruction of one message sent to the brain by another one sent thither, or the obstruction of sense-message through the nerves to the brain from proceeding on to the nerves going out from the brain to some organ. Pavlov found that the inhibitory process originating in one brain-centre may spread to adjacent centres, so that other activities become inhibited.

29. Pavlov explained Sleep as a spreading of inhibition in the cortex. There would be pure or perfect sleep if the cerebrum were completely inhibited; and there would be pure or perfect waking if there were no inhibition whatever. But there is no pure sleep or pure waking. At any moment, some of the brain centres are inhibited, and to that extent the animal is sleeping; some are reacting to incoming stimuli, and to that extent the animal is awake. When many are inhibited, the animal is slumbering; but the sleep is not perfect. There are many grades of mixture of excitation and inhibition in the brain between perfect sleep and perfect waking. When the mixture is of unusual constitution, the animal shows unusual behaviour. It may fall into a trance or into Charcot's cataleptic stage. Thus after receiving a stimulus the conditioned reflex to which had been later extinguished, a dog became suddenly stiff but still on its legs. In this state, it is claimed, the centres in the cerebrum were inhibited so that no notice was taken of most incoming stimuli, but the lower centres in the cord and brain were not inhibited, for they kept the animal in balance and erect. This was a state of hypnosis, brought about by subjecting the animal to stimuli whose normal responses have been extinguished by lack of reward, so that they produce an inhibiting

effect. The meaning of the stimulus had been destroyed; it had become senseless. Such are the stimuli that tend to hypnotize. In this way, Pavlov justifies the meaningless passes and shining buttons and lights and revolving mirrors favoured by the Mesmerists and the Charcot school. The patient's brain makes nothing of them and the concentration on senseless symbols or insoluble problems gradually inhibits the brain-centres until the hypnotic state is induced. He showed, however, that inhibition is an activity in the 'highest' part of the brain; ignoring stimuli is a positive process.

30. Concentration, said Pavlov, is only a state in which, in spite of strong excitation of some centres, the unengaged centres of the subject's brain are inhibited, or asleep, so that he is oblivious to everything except what he is attending to. Sleep is, therefore, a positive activity in the brain brought about by stimuli flowing into it. The stimuli may come internally from fatigued muscles, as in often the case; or they may be external and prove to be monotonous to the animal. Sleep is not an absence of activity in the brain. By it energy is organized and the muscles and tissues of the body are rested and given time to repair the loss of fat and tissue due to use. Muscular fatigue is only one of many stimuli that can induce sleep.

31. Pavlov and his group have not succeeded in making the dog suggestible and obedient to commands when in a trance.

32. Before going further, it is advisable to say a few words on Telepathy and Double Consciousness or Duplicated Personality.

33. Telepathy is a sort of thought-transference, a communication of thought from one person to another, stated to be otherwise than through the known channels of the senses.

34. Many cases are cited of such a transference of thought by mere contact or by the presence of the communicator, and, it is alleged, even at a distance.

35. The celebrated case of Clever Hans, the horse that could work out problems in Arithmetic (about whom we have spoken in the Chapter on "Instincts") could not be reduced to thought-transference; what is so doubtful in the case of men, who, all agree, think, could not be granted to a horse whose thinking processes are at the most doubtful. The explanation was, therefore, a rational one, *viz.* that the horse was hyper-sensitive to the slight physiological reactions of the person present who knew the answer to the problem set, and it responded to the impulses received from him. The proof was as conclusive as it could be. Since hyper-sensitivity and hyper-suggestibility are so peculiar to hypnosis the explanation of telepathy when there is contact with or even in the presence of the "communicator", is easily forthcoming. With regard to telepathy "at a distance" in which the explanation by hyper-sensitivity and hyper-suggestibility are obviously out of the question, we may say that there are no authenticated cases as yet.

36. Double Consciousness is the state in which the unity of psychic life is split up, and two—or more—seemingly distinct mental existences, centering, as it were, about two different personalities, present themselves, sometimes alternately, and sometimes—it is alleged—simultaneously in the same physical individual. The state has also been called Multiple or Dissociated Personality. Morton Prince (1854-1929) of Boston, U.S.A., used hypnotism in treating persons who exhibited this phenomenon. He produced this state often in experiments, and put forward the concept of "co-consciousness" to explain it. Pierre Janet (b. 1858) in Paris was also greatly taken up with such cases. He instanced many in his *L'Automatismo Psychologique.* Alfred Binet (*Alterations of Personality*)

cited the celebrated case of Felida X, who was methodically observed for several years by Dr. Azam of Bordeaux.

37. Felida was born in 1843. As a child, she was serious, of a somewhat morose and obstinate disposition, of mediocre abilities, but very industrious. She was inclined to be hysterical. In her fourteenth year, one day she suddenly fell into a swoon. It lasted only a few minutes. When she recovered, however, her whole character seemed to be changed. She was gay and boisterous, very sensitive and yielding, idle, but observant and seemingly of more than average abilities. Felida II could remember her experiences in her former life, that of Felida I, and appeared to be normal. After some months, she was subject to another fit, and, on recovery, she assumed again her original state. Felida II was no longer there in her place; again the same dull, sullen, obstinate, industrious, mediocre Felida I. Strangely, however, she completely forget all the events in the life of Felida II.

38. Felida alternately passed through the two states for thirty years. In the 'secondary' state, *i.e.* as Felida II, she retained the memory of both states; but as Felida I, there was complete amnesia of the secondary state, the intervening epochs of Felida II being mere blanks. Thus she could not recollect such events as the First Communion of her children or the death of her sister-in-law, which occurred during the life of Felida II. She only felt the 'primary' periods as inconvenient and disagreeable. As time went on, the 'secondary' periods lasted longer and longer, so that she finally remained mostly as Felida II.

39. Thus Felida seemed to be endowed with "two consciousnesses", one of which (the 'primary') was entirely "split off" from the other.

40. Binet, accepting personality as made up of character and memory, accorded two personalities,

two Egos to her, and he admitted the possibility even of triple or multiple personality on the score of divisibility into parts. Janet also accepted multiple personality and cited some instances. Willim James called the changes in character and memory Mutations of the Ego, as he refused to recognise a change of identity. In this he is inconsistent. According to him, " the present thought is the only thinker," and "identity is seemingly and sufficiently preserved by each thought 'appropriating' and 'inheriting' the contents of its predecessor. In the above case, Felida II has to 'appropriate' and 'inherit' not from Felida I, but across a span of seven months from the last Felida II. James saw the absurdity of the conclusion of his theory, by which identity becomes only apparent and at each moment there would be a different person in the same individual. Hypnotists explained the phenomenon as a dissociation, such as may be produced in hypnosis,

41. Max Dessoir and others formulated a theory of the *Doppel Ich* (the "Double Ego"). They attributed several consciousnesses to man, at least two, really distinct, at one and the same time. They cited in their support the power of distractedly following out a line of thought while reading aloud or playing the piano or doing some other complex action; the involuntary inspiration of the poet; abnormal "automatic writing"; the struggle between reason and passion, the "higher" and "lower" self; as well as all forms of sub-conscious mental activities. Each consciousness is held together by its own chain of memories and associations, but each is "split off" from the others. Thus there would be no single unchanging Self in man; self-consciousness would be really multiple or at least double in its ultimate constitution; and our seemingly personal identity is merely a fusion or mixture of different factors, held together in one Ego, as it were, by a sort of cohesion.

42. Let us now examine some of the theories and the evidence brought up in their support.

43. We have already indicated the differences between the rival schools of Nancy and Paris, both in outlook and practice. The explanation of hypnosis by the Nancy school gradually gained favour. However, the explanation by suggestion and imitation alone will not help. What needs to be explained is that in the circumstances suggestions operate in the manner they do at no other time. The comparison of hypnosis with natural sleep is plausible, as there may be heightened sensibility and suggestibility even in sleep, *e.g.* a mother awakens at any time at the slightest cry of her infant; a pressure on some part of the body influences a dream by "suggestion". If I am partly hanging off a cot, I may dream of falling through space. In dreams there is sometimes a sense of helplessness, Janet's 'feeling of inadequacy', resulting in a paralysis. This may occur even in ordinary life, *e.g.* I feel giddy when I look down a precipice. In dreams there is dissociation, a mixing up of past experiences, amnesia, and illusion, with a sense of reality. There is often a correct appreciation of time duration, *e.g.* if I have a strong desire to get up at a particular time in the dead of night, I awaken almost at the precise minute. If I think over my dream immediately on awakening, I recollect something of it; but it is most often faint, and generally forgotten in such a short time (especially if I did not have strong emotions) that I think I had a dreamless sleep. Very often I know that I had dreams in my sleep, but I cannot recollect anything. There is, of course, no blind obedience and consequently no "deferred suggestion". Nor is there any rapport.

44. The effect on one's nerves of a bad dream may not be very different from that of a strong form of hypnosis, even if the dream be forgotten. It is even stated that we may direct the dreams of a person, if we hit upon their current, by suggestive sense-impressions. There is a selective reception of impressions. Those which fit in with the current of the dreamer's thoughts may have an abnormally intense effect.

45. In hypnosis, we have a fixing of the attention so that rival impressions and thoughts are 'blocked out'; the attention is, as it were, rivetted on the hypnotizer alone. For normal sleep, the less the attention is concentrated the better. In spite of differences, we do not doubt but that the sleep produced in hypnotism is to some extent the same physiologically as normal sleep. There are many other comparisons of hypnotic phenomena with common-place occurrences, e.g. those made by Prof. Rivers. In third-degree methods, one form of torture is the suggestion of a beetle boring into the vitals by placing it over the navel of the victim, covered with a cup. A shikari tensely awaiting the approach of a tiger may be so convinced that he has seen it that he will even fire at an illusion, and then call himself a fool.

46. Let us now consider Pavlov's explanation. He compares sleep to hypnotism, instead of hypnotism to sleep. Having defined behaviour as reaction to stimulus, and explained sleep as the spreading of the action of inhibition (the active opposite of excitation) in the cortex (which is itself made up of cells of the same nature as the nerves), sleep becomes an activity, the active opposite of waking. Neurones, according to him, are essentially active. Excitation as well as inhibition are active processes. Pavlov has no place for mental passivity. Food brings about an excitation in a dog. A stimulus is associated with the food and the excitation is correspondingly associated with the stimulus until it follows automatically. This is the conditioned reflex. This reflex is extinguished in the reverse manner by dissociating the stimulus from the food. In the place of an automatic excitation, there is now an automatic inhibition. This inhibition is a partial sleep. The inhibition spreads in the brain centres and the sleep spreads until it appears like normal sleep. However, satisfactory this theory may be in the case of animals, it is unsatisactory when applied to man. If the smothering

of sense-impressions, the excluding of the possibility of their interfering with the reactions to certain selected sense-impressions is a positive activity of the brain, we fear the mental strain of a man would be very severe. We know how difficult it is to concentrate when there are many things that would distract us. We rather think that normal sleep is a passive state, or even as Janet said, "a lowering of mental tension", by which attention is not forced on to anything in particular and mental associations are allowed to follow on undirected by the mind; and that the deeper the sleep the more the senses are dulled. Pavlov's explanation does not cover suggestibility. His dogs did not reach that stage. He has not shown that they become hyper-sensitive. He has not discovered any rapport or illusion or amnesia. He does not show why one particular sensation should inhibit so many others, and which sensation it is to be. His surmise that unusual combinations of excitation and inhibition give unusual behaviour is a guess for convenience. Even in impressions of the same sort, e.g. touch, there is selectivity and Pavlov's theory slurs it over. To extend his results from dogs to men is to disclose a philosophical bias Materialism. His explanation is strained, one-sided, and unsatisfactory.

47. Munthe's queries have still to be answered. "What was this mysterious force that seemed to emanate from my hand?" He had operated on a lioness. By a mere touch on the forehead with the top of his fingers, he had put a young foreign diplomat to sleep. Prof. Karft-Ebing of Vienna and even Charcot of Paris failed to hypnotize him. Birds, reptiles, and animals succumbed to his power. Lunatics who could not be subdued by the famous Prof. Voisin were subdued by Munthe. "There must be some other power (than suggestion) at work. I ask again and in vain, what is this power?"

48. We venture to suggest that it is not a mysterious power or a mystical 'force'; but that it is

nothing more mysterious than sympathy, or, if you will, that tendency or striving for unification that is so obvious to one who looks for it. We have seen two aspects of it, isolation or the strengthening of a limited unity, and extension or absorption into a larger unity. That 'power' is not more mysterious than falling in love, making friendships, getting a following of admirers. Why does a girl reject a man whom she knows to be good and upright and who has for years adored her, and pick as her mate a new acquaintance of whose faults she cannot but be aware? Why does a man take a liking to a particular person in a company of new acquaintances? Why is one person popular and have staunch friends, while another is only liked but cannot enjoy strong attachments, and another arouses my dislike? These are common questions. No one thinks of any mysterious force, even if he speaks of "sex-appeal" or "personality" in a vague sense. The reaction of one person to another depends on his own temperament, or, if you will, his "conscious attitude" and on the nature of the human contact between them, as well as on the impressions received. Firstly is required sympathy with the other and a sense of sympathy reciprocated. It is this which strengthens the bond. By sympathy with another in myself I am more "sensitive" of his sympathy towards me. This increases my sympathy, and so on. Some sympathy in a person with animals and other persons is natural; it is the seed that grows. Munthe himself was a man whose sympathy for men and animals may well be compared to that of St. Francis of Assisi, the saint to whom he was so deeply attached, although a Protestant. The serious troubles into which his love for animals and birds landed him, his exhausting work during the epidemic of cholera at Naples and the earthquake catastrophe at Messina, bear this out. With regard to falling in love, Munthe says: "It is less a question of senses than man generally understands. A woman can fall in love with an ugly man, even an old man, if he rouses her imagination.

A man cannot fall in love with a woman unless she rouses his sexual instinct". It may be after all sense-suggestions. Yes, Dr. Munthe, that mystical power you speak of was a 'flow' of sympathy, in the glance of your eyes, in the touch of your fingers, in the expression of your face, in the tone of your voice, in your attitude of understanding.

49. Let us quote from Dr. Munthe again: "To become a good dog-doctor, it is necessary to love dogs, but it is also necessary to understand them —the same as with us, with the difference that it is easier to understand a dog than a man and easier to love him..... A dog gladly admits the superiority of his master over himself, accepts his judgment as final, but, contrary to what many dog-lovers believe, he does not consider himself as a slave." A dog, for example, is so susceptible to the natural indications of sympathy that it instinctively knows the dog-lover from the dog-hater. Common experience in addition to that of Dr. Munthe himself confirms this. Women rush to doctors, they flock to waiting-rooms of psyche-therapeutists in the hope of sympathy. By this sympathy there is a sort of unification, it may be even in the higher behaviour of man; unification of understanding and willing, by which the suggestibility is heightened and the sensitivity quickened, and which is itself the rapport giving rise to blind obedience and even to deferred-suggestions.

50. "How are we to explain the success of the one operator and the failure of another? Why does the suggestion of one operator re-echo as a word of command in the subterranean workshop of the subject's mind to bring its hidden forces into action while this same suggestion made by another operator is intercepted by the subject's consciousness and remains ineffective?" In the same way, one operator can arouse the imagination and form a strong sympathetic

bond, while another, e.g. Dr. Munthe's friend, Dr. Nostrum, cannot. The patient will assume different 'conscious attitudes' towards the two. In one case the frame of mind or mood of the patient may produce exceptionally selective activity and susceptibility; not so in the other case. The attitude of mind when a command is given to be done in certain future circumstances, may so persist in its physiological counterpart, that when the right circumstances arise, by their physiological associations, already formed in anticipation, the same attitude will recur and the deferred-suggestion obeyed. So also, although a subject will have forgotten the events of his last trance, he will remember them fully when again put into a trance. The images and feelings associated with a conscious attitude can be recalled when the same conscious attitude is again induced. Time also is estimated not by abstract mental processes but by physiological processes going on in one.

51. Reptiles, birds and animals are more easily hypnotized than men, because they are subject to passive association. They have no understanding in the higher sense. They are conscious of their feelings and images. Their associations and dissociations are not directed consciously. In experiments on the conditioned reflex the associations and dissociations are directed by the experimenter. They do not abstract significances, e.g. a certain signal means that food is coming. By poetical analogy, we may interpret their reactions in this way. If hypnotizability depended on having a well-developed, impressionable nervous-system then it would be easier to hypnotize birds than reptiles, beasts than birds, and men than beasts. But the order of hypnotizability does not correspond to fine nerve structure. Most birds are easily hypnotizable. Monkeys, very highly developed, are also easily put to sleep. Man manifests understanding and willing, and for this very reason he may be either very easily hypnotizable or on the other hand

refractory. The representations of the imagination have the senses working in co-ordination as their correctives, and in man also reason. The intensity of an illusion is proportional to the strength of an impression and the suspension of the other faculties. It is enormously increased by attention. Hence it tends more to express itself outwardly by movement of the appropriate muscles. It is attention also that augments sensibility. It is by attention that there can be inhibition, the active suppression of competing stimuli. It is by attention, therefore, that the subject is directed to receive only the suggestions of the hypnotizer, and that these have their exceptional effect. Persons with phobias and obsessions and lunatics cannot be easily hypnotized; it is by no means easy to make the suggestions fit in with the frame of mind. No one can be hypnotized against his will and without his co-operation.

CHAPTER XXIII

PERSONALITY

1. We shall now say a few words on the theories of personality brought forward in connection with certain remarkable cases. Cases like that of Felida are extremely rare and to build up a general theory on the strength of such cases is absolutely unscientific. There is a temptation, even among scientists, to look for cases which will support some preconceived theory; and, when one is found to see it through coloured glasses and report the abnormal aspects of it in grossly exaggerated terms. Thus in the case of Felida, it was reported that all the events of one state were completely forgotten in the other. This was not true; as there was a mass of common experience retained throughout, the use and meaning of language, familiarity with persons, subjects, localities, relationships,

etc. In fact there was more continuity than discontinuity in the two states. And so it is in all properly investigated cases.

2. Again, before accepting any " mutation " of the Self, the notion of the Self must be properly defined. In one sense, there is continual change. Physically, physiologically and mentally I am changing instant by instant. This is well known. Character also may undergo gradual or even cataclysmic changes. Boetius defined person as "an individual substance of an intellectual nature". The Scholastics defined person as " a substance, singular, complete, of its own right, endowed with intellect", i.e. a substance individuated, adequate for its connatural operations and not requiring another substance to complete it, subsisting incommunicably in itself and for itself, to which properly all operations are ultimately attributed, and which is directive of its own actions. Personality is considered as the nature of a substance viewed with the added aspects of subsisting in itself and operating for itself. These definitions of the Scholastics and of Boetius are of course unacceptable to many moderns, chiefly on account of the notion of "substance". If, however, Realism be accepted, " substance " must also be accepted in the scholastic sense. It is then only that " identity in difference " may be accounted for, as we have elsewhere explained. No doubt, what the mind abstracts from a thing is a plan made up of relations. It is the general plan which is developed and to which new details fit in, that we conceive of a person. In spite of changes of temperament, of mental and physiological attitudes, and habits; in spite of changes in the matter (in seven years, it is said the material make-up of a man is totally changed), in spite of physical and mental development, there is identity of the individual.

3. The identity is seen in a continuity in space and time. The term " person " is used of man, not of animals or inanimate substances. This is because

most of us recognise the existence of a soul, which remains identical in spite of all the human changes. In the case of an animal, the continuity in the matter, habits, actions, etc., as perceived by us, may be reduced, perhaps, only to spatio-temporal terms. Nevertheless, when there is a change, there is so much physiological identity enduring for such a considerable time, and, in addition, a physiological plan persisting in outline through all the changes, that we are justified in considering the animal as one and the same throughout its life. In the case of men, endowed with mind, although consciousness is not in fact continuous, still there is a unity of reference and a mental plan persisting, even in the series of consciousnesses, that add to individuation and may be properly called "personal".

4. A definition of person that was accepted by the Scholastics was "an undivided rational substance". The notion of "substance" was repudiated in several philosophies from the XVII century onwards; that of "rationality" was gradually whittled down to zero, as materialistic opinions gained sway, and it was attempted to show that rationality was not peculiar to man. (Some would even hold that it is found in the electron!)

5. Person, however, obviously implies a whole with many aspects and functions, and a special kind of whole. The functions are conceived as being "of" the person, not as elements constituting the personality. However independently we may imagine them to operate, however different we may suppose their sources to be, however conflicting they appear to us, they are of the whole, subordinated to a wholeness, bound together into a unity, by something not of them but above them and of which they are: a unity that no one can deny. One cannot think or speak of a human individual and overlook the characteristic feature of its being a person.

6. The dignity of the person arises from the conception not of its constitution but of its end and value. It is raised to the highest by the emphasis placed by Christianity on responsibility and freewill, by the doctrines of a supernatural end, of grace or a quasi-deification of man, of the "Body of Christ", of the Hypostatic Union, of the Redemption by God-man, of the Resurrection, and of the Communion of Saints. No philosophy that is not Christian endows the person with such a peculiar dignity; none can safeguard it; inasmuch as a philosophy affirms and attempts to demonstrate the dignity of the person it merits the distinction of retaining so much of Christianity.

7. The Self is one's own person in the aspect of being the centre of reference. It is the manifestative reality to which are attributed the manifestations, and it is the reality apprehending the manifestations.

8. An important distinction must be made between the Self as immediately apprehended in its operations and the Self looked upon abstractly. It must be noted also that apprehension is itself an operation of the Self. The former is the Self experienced in its distinctions, the Self from the non-Self, one integral part from another; the latter is the Self viewed, as it were, objectively, in all its reactions, including that of apprehension. The former is the Self apprehended concretely in the immediate experience as the subject or that which is acted upon and reacts; the latter is a conception of a complex character. It is an intellectual abstraction formed of the concrete perception of Self in all its past and present experiences. This may be called the Ego, to distinguish it from the Self, immediately apprehended. Ego is a notion of the Self as got from all the events of my past life, of my corporeal organism, my physical and mental experiences; my feelings and moods, desires and needs; my dispositions, habits and peculiarities; my relationships to things and other 'selves'; my

motives and strivings; my successes and failures; etc.—all these being held together and referred to the Self by Memory.

9. This notion, the Ego, is constantly being changed. At any moment it is not the same as the Self *hic-et-nunc* apprehended. I have different notions of a "chair" at different times, according to the circumstances. So also there is a different Ego at different times, in different circumstances. I have no fixed notion of the Self; the notion is influenced by the present circumstances, by the general conditions, by the immediately past thoughts, feelings and desires, by the anticipation of the future. It is at any time incomplete, and only partial, and may differ considerably at two different times. It emphasizes some particular aspect, a state or experience or quality, certain relations. In this sense only, we may speak of "mutations" of the Ego. If, however, the Ego is not in harmony with the Self *hic-et-nunc* experienced, there is mental disturbance and disequilibrium. Every other idea is put into relation with the Ego. It is the centre of one's conscious thoughts, to which they are directly or indirectly related, and which therefore become part of it. It is because the Ego is a complex notion abstracted from my remembered experiences that suggestion and fixation of attention can induce a perversion of imagination, illusion, amnesia, dissociation, and bring about the so-called "alteration or duplication of personality."

10. Without a "personal unity", the basis of the identity of the Self, there could be no acquisition of knowledge, no learning, no reasoning, no judging; there could be no significance in expectation, in our hopes, desires and aspirations, in our anxieties, in our actions and in our resolutions. The interruptions to consciousness do not matter; it is the unity of the centre of reference that manifests the unity of the person and the unity of the plan, physiological and mental, that proclaims the identity. Just as a substance

is the reality manifesting itself as an individual complete plan, so person is the reality in man.

11. Variations in the representation of one's personality are largely occasioned by perturbations of memory. There are several cases of loss identity. A celebrated musical genius, P. of Rome, firmly believed that P. was long dead. He himself, he said, was X, and he lamented the death of P. The power of remembering depends on the state of the organism. A particular set of cerebral conditions may either re-instate or exclude a particular group of recollections. A brain lesion may also completely wipe out certain recollections. Felida's changes may be accounted for as due to alterations in the functioning of the brain brought about during the transition. Little is as yet known about the changes that go on in the brain. Certain it is that definite areas of the brain are connected with definite types of mental activity. This because mental activity is so dependent ultimately on sensations, and the different sense-organs have separate, though interconnected, cerebral connections. In the case of P, a highly-strung morbidly sensitive man, the sense of loss of his youthful vigour and fiery inspiration suggested the dissociation—a sort of death of the P. as he used to be. There is also a False or Idealized Ego, i.e. when the notion of the Ego is built up of ideas of what one would like to be or to be considered. The Self is, of course, the corrective to false estimations. When there is discrepancy, there is mental perturbation, for the mind can only harmonize with truth. It is not necessary here to go further into this point. Let it suffice to say that the Ego ***proceeds*** from, or is ***generated*** by, the Self; the Self loves the Ego, and this natural love is part of the notion of the Ego. Love, therefore, ***proceeds*** from the Self and the Ego.

12. Character, roughly speaking, is an abiding or habitual frame of mind, a sort of a plan in bro

outlines of thinking, desiring and acting. Even this may be changed considerably for the same reason that it can be "built up". It is the duty of the psychologist to explain abnormal phenomena as variations from normal life, and not concoct hypotheses of normal behaviour with conclusions deduced from abnormalities.

13. So called "secondary consciousness", adduced to support the view that a person is a complex of two or more selves, may easily be considered as faintly experienced activities, or as reflex processes of the animated organism experienced in consciousness.

14. The prominence given to Hypnotism and to the strange phenomena connected therewith, and the various theories propounded, profoundly influenced Psychology at the end of the last century. To this may be added the influence of the Evolution Theory, by which the phenomena were related to the experiences of the human race in the course of Evolution. In the West, the doctrine of transmigration was not in favour. If it were, it would certainly have claimed support from the phenomena or provided another Theory of Hypnotism or been the influencing factor in exaggerated accounts of certain strange phenomena.

CHAPTER XXIV

SELF AND NON-SELF. EGO AND NON-EGO.

1. Let me consider myself firstly. As I grew up, it became more and more clear to me, and consistently so, that there is a reality in me manifesting itself to me as an individual whole, acting and reacting as such. This is the Self, that which acts and that which is acted upon. The notion of the Self and of the external world or of the non-Self grew up together. That unity which I perceive in the Self is limited in

its modes. However, there is a mode by which my unity, my Self, enters into a higher unity, and this mode is the perception of relations within the Self and of relations between the Self and the non-Self. In this way I find my Self as entering into a higher unity, as a complicated detail in a still more complicated Plan. The External World enters into my unity by perception of the relations binding the Self and the non-Self together. The *urge for unification of the Self and the non-Self is a primary fundamental urge*, or a primal tendency, and the greatest unification is a mental one. The Mind is the manifestation of this sort of unification of the Self and the External World.

2. A notion of the Self is the Ego. The Self is the experiencer and performer, and the Self is also the observer and the interpreter. At any moment I have a notion of my Self, and that is the Ego of the moment. Anything else is perceived as related to the Ego. The Mind therefore is the notion of the Self and of the non-Self in their relations. The Ego is constantly changing. At any moment, in certain circumstances, it emphasizes some particular aspect of the Self. It is the general plan running through all the Egos, or rather the plan into which they fit in, that manifests the identity of the Self.

3. Anything is perceived in its relations to the Ego. There is constant adjustment and re-adjustment, the relations being varied so as to produce harmony in the Mind. There is never perfect harmony, but there is always a movement towards equilibrium; hardly is one equilibrium set up than it is upset and a new movement started. The movement may be said to be continually turned this way and that. Naturally the emphasis varies. There is what we may call an 'egoistic' quality in the process; the Self tries to make any new apprehension fit in with the momentary Ego plan. At any moment direct relations with the Ego

may not be permanent in the Mind, but some such relation is ready to spring up. If an idea causes perturbation, there is a tendency to reject it; but being, as it were, embedded in the Self, it may crop up again and again. There is also an 'altruistic' quality: the Self modifies the Ego to fit in with the apprehension. The present Ego or notion of the Self is dependent on immediate experience and all that it brings up into the Ego ; but it is also dependent on its preceding state, on memory, on associations with past states; in short, on all the previous Egos. These can all, therefore, be correctives to the Ego, removing undue emphasis, bringing up other relations, co-ordinating experiences. Thus I can have a quasi-objective notion of the Self, a notion in which strong feelings and prejudices and all the strong influences of the moment are subdued ; an Ego in greater harmony with the present experiences and also with the past life of the Self. " O wad the pow'r the Giftie gi'e us To see ourselves as others see us ". It is the general plan into which all these quasi-objective Egos fit in, that ensures their identity in the one undivided substantial Self.

4. Even in a society, there is the concrete social Self, made up of the members bound together in some way, say, by interdependence in their lives. There is also a social mind. This is a notion of the social Self or concrete social group in its relations with other social selves. It is the common notion, or what is common in the notions held by the individuals in general, of the community in its relations to other communities. This social mind depends on customs, traditions, education, propaganda, etc. Needless to say, it is also most variable. In its outward expression, it may vary from Nazi racialism to the pariah's abject subservience, from Shinto Celestialism to the savage's worship of the powerful white man. The influences that would modify the social mind are the same as those that would modify the individual mind. However, they must affect a large proportion of the community,

and must be apprehended as affecting them in common.

5. The tendencies are similar. In the individual Ego there is the general tendency to unite by relations of harmony as well as the special tendency to reject something as extraneous that does not adjust itself in the mind. The rejected idea, however, cannot so easily be thrown out of the mind, as it is embedded in the Self, and constantly crops up to upset the mind. In society also there is the general tendency to settle down by friendliness, tolerance, etc., as well as the special tendency to 'excommunicate' an individual that would upset the social equilibrium. The special tendency is to strengthen a lesser group-unity even at the expense of a wider one. That is why 'parties' arise and we cannot get away from party-politics. It is only a higher and a wider view of things that will keep in check the disintegrating influence of the tendency to unification manifesting itself in a part in opposition to the whole. There is an egoistic quality in the movement of unification, and also an altruistic quality, just as in the individual.

6. We have referred just now to the tendency to reject an idea that does not fit into the mind. There is no doubt but that effort is required for adjustments of ideas, and an effort demands willing. The adjustment may gradually become, as it were, habitual, by constant repetition of similar adjustments. Thus one is able to solve mathematical problems or to 'grasp' a situation or to pick out means to an end. Let it suffice that the point has not been overlooked. We must not overlook the directive activity of the mind, its control of association and dissociation.

7. Owing to physical maladjustments there may be mental troubles also. A person suffering from a phobia is one in whom a particular strong feeling, *e.g.* hatred, is easily aroused. It has become associated

with so many images and ideas that when one of these crops up the feeling comes up also. This is perhaps due to some brain centre not being properly co-ordinated with the whole, or to some parts functioning inordinately. By developing the 'will' the subject can gradually overcome his defect. The same is true of an obsession, in which a badly synthesized idea becomes 'fixed' and also persistent, *i.e.* obtruding itself into the mind constantly.

8. When there is 'loss of identity', it is because the subject fails to 'connect up'. Owing to some organic defect, his memory does not function properly; he sees a plan into which his Egos fit in; but there is a lack of continuity, a hiatus in the series. After a very serious accident, a person lost his identity. His previous life was a blank to him. Indeed, if he were pressed to recall the circumstances of the accident, he would make an effort but soon be overwhelmed and about to break down, so that it seemed wiser to calm him and avoid referring to the incident again. The feeling that had come to him during the accident must have been so strong that it could easily be aroused again. Moreover, when aroused, it 'blacked out' everything else, and it could not ever be made to fit in with a quasi-objective Ego.

9. In the mind, the Ego or notion of the Self may be distinguished from the non-Ego or notion of the non-Self. The basis of the distinction is that of the concrete realities that are seen in their relations to the Self; and in spite of their modifiability there is a great deal of independence in the relations from the work of the mind. It is by the constant impact of the Self and the External World that the mind is corrected. It is this meeting of realities that keeps the mind objective to some extent. It is as wrong to say that the environment is the only factor as it would be to say that the Self is the only factor. The tendency to unification works itself out externally also in the

adjustment of the Self with its environment, in the movement to bring the Self into conformity with the Ego, and in the movement to bring the non-Self into conformity with the non-Ego.

10. We may say analogically that the Ego is 'generated' by the Self. It 'proceeds' from the Self and is in the Self. The urge to unification may be called Love. By Love the Ego tends to equilibrium, and an outward movement is initiated to bring about a greater conformity of the Self with the Ego, a greater harmony between the Ego and the non-Ego, and a greater conformity between the non-Ego and the non-Self; so that there will be more permanence in the Ego and consequently a greater facility to attain equilibrium. Love thus 'proceeds' from the Self and the Ego.

11. In the lowest manifestations, Love is the urge to eat, to hold, to embrace, to hug, to have sexual intercourse. In these manifestations, the urge is doubtless towards unification, but the effects are transient. Permanence comes in the higher manifestations where intelligence and willing are apparent. I am united in my Mind to the one I love, and my outward actions are directed to strengthen this unification and to make it permanent. Utilitarian relations, sympathy, association of thought with pleasurable feelings, admiration, respect, common outlooks and sympathies, a unification of wills, identification of interests—such are the relations set up by Love in the Mind—the notion of the Self and of the person loved in his relations to the Self; and these are factors conditioning my external actions.

12. It is fairly certain that Love may start in its very lowest form and advance higher. This is because in its lowest form it is sufficient to bring up and keep the image of the loved one constantly in Mind so that more and more relations may be set up between the

Ego and the notion of the loved one. But Love goes further than the Altruistic Urge; it strives for objectivity. Communion is the perfect reciprocation of Love, a perfect union of harmony between the Self and the non-Self.

13. The impact of the realities Self and non-Self stretches across the Mind, which is an extension of the Self.

14. Let us recapitulate. For me the world is made up of the Self and the non-Self or External World, which, inasmuch as I react to it may be called my environment. By the Mind the World, as it were, enters into the Self, and by the Mind the Self extends into the World. The Mind is a reaction of the Self with the non-Self. Both are its factors. The Mind consists of notions of the Self and of the non-Self, i.e. the Mind is made up of the Ego and the non-Ego. They grow up together. Their corrective is the impact of the realities, Self and non-Self. There are real relations of reactivity between the Self and non-Self, potential, by which they react, and actual, or set up by the reactions. In the last resort every notion is a set of relations. Sir James Jeans said somewhere that the electron cannot be pictured or described, but that if you ask the scientist What is the Electron? he will say: Tell me all you know about it. When you have done this, he will say: Well, that precisely is the electron. This is a striking illustration of our point. Every reality is perceived as a set of relations internal and external, the whole being the mental representation of the reality. The truth of the mental representation is guaranteed by its consistency, a consistency which is not merely a logical one but which is also and chiefly a consistency with that impact of realities by which the Mind is constantly adjusted and developed. This is in particular assured for me by the objectivity of the mental content, i.e. by its acceptance

by our fellowmen as being in accord with reality; for in the agreement of many not only are the idiosyncracies of the individual eliminated and momentary emphasis reduced to its proper proportions, but also experiences are multiplied, becoming more and more so sufficiently varied and extensive that by co-ordination with one's own experiences very much more correspondence with reality may be attained and justifiably assumed.

15. A real equilibrium will be set up by the relations between the Self and the non-Self as envisaged in the mental relations between the Ego and the non-Ego. For that equilibrium to be stable objectivity is required in these mental relations; for neither will there be equilibrium with any sort of permanence between the Ego and the non-Ego unless there is objectivity or correspondence of the whole Mind with Reality.

16. The Urge to unification or to equilibrium in a harmonious system, therefore, takes several external forms: (1) to make the Ego correspond more and more to the Self, and the non-Ego to the non-Self: this is the urge to objectivity; (2) to make the Self correspond with the Ego in all its conceived relations to the non-Ego: this is the Altruistic Urge; (3) to make the non-Self correspond with the non-Ego in all its conceived relations to the Ego: this is the Egoistic Urge.

17. We know that adjustments in the menta content can all be actively directed by the person In the active fulfilling of these urges, therefore, we recognise the quality known as willing. We may, therefore, call the active working out of these urges by the name of *wills*; so that we have the Will to Objectivity, the Altruistic Will and the Egoistic Will. In a sense, referring to the definitions, the Will to Objectivity is opposed to the other two wills; the

movements being in opposite directions. The Will to Objectivity is seen in the growth of Science, in the co-ordination of knowledge, and in the better understanding of human nature. The Altruistic Will is directed behaviour by which the Self is actively modified to correspond with the Ego in all its conceived relations to the non-Ego. I have used the term Altruistic for want of a better, since the non-Ego is the centre of reference. The Self is to correspond with the Ego in order that the relations of the Ego to the non-Ego may be realised. The Self is referred through the Ego to the non-Ego. The Egoistic Will is directed behaviour by which the non-Self is actively modified to correspond with the non-Ego in all its conceived relations to the Ego. I have used the term Egoistic for want of a better, since the Ego is the centre of reference. The non-Self is to correspond with the non-Ego in order that the relations of the non-Ego with the Ego may be realised. The non-Self is referred through the non-Ego to the Ego.

18. These two wills, the Altruistic and the Egoistic, may also be in conflict. In the former, the non-Ego is kept, as it were, fixed; and, in so far as it is wanting in objectivity, the Altruistic Will will proportionately fail in its realisation. In the latter the Ego is kept, as it were, fixed; and, inasmuch as it is wanting in objectivity, the Egoistic Will will proportionately fail in its realisation.

19. The tie binding these two together and with the Will to Objectivity is the objectivity of the relations, potential and actual between the Ego and the non-Ego. The three Wills are co-ordinated and kept in harmony in so far as the relations between the Ego and the non-Ego are truly representative of the relations between the Self and the non-Self, this itself requiring that the Ego is truly representative of the Self and the non-Ego of the non-Self. By those objective relations only will equilibrium be attained

between the Ego and the non-Ego; but not only in the Mind, but also in reality, between the Self and the non-Self.

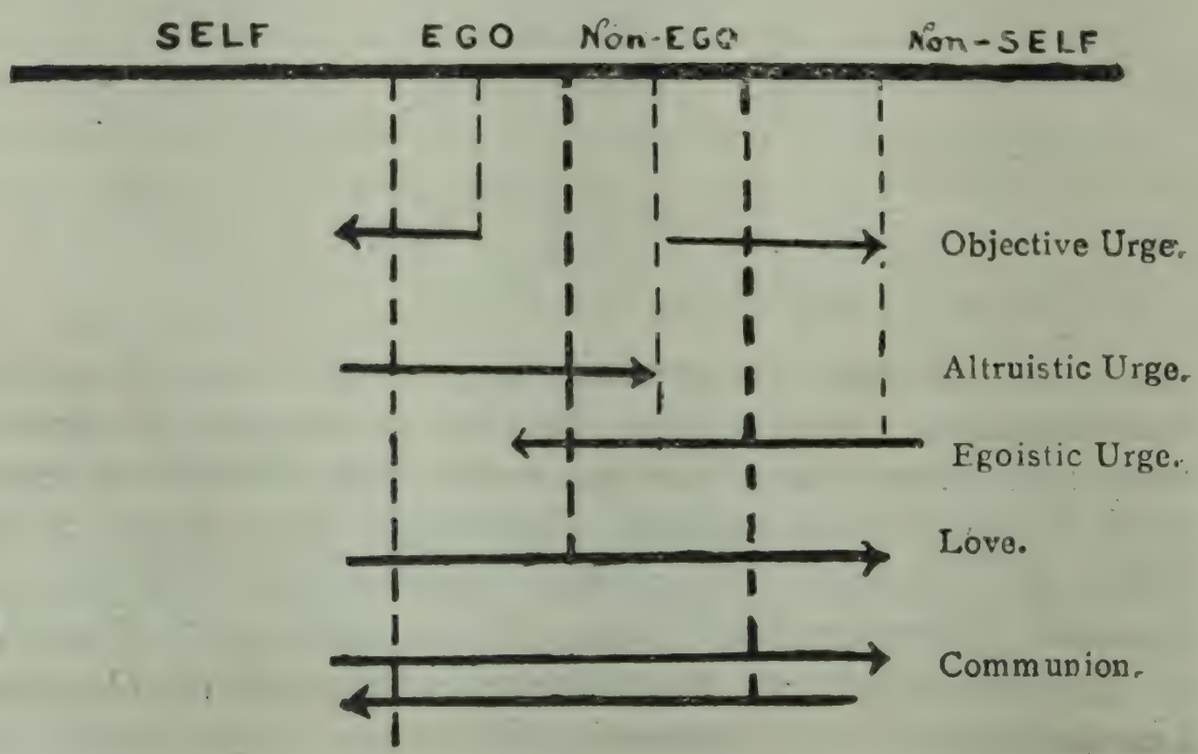
20. This equilibrium is certainly a dynamic, not a static, one. It is not necessary to enlarge upon this point here.

21. We can arrive at a knowledge of the two Wills from another consideration. We have spoken already of the general urge to unification. In human actions, this will result in two movements oppositely directed: the movement of adjusting the Environment to the Self, and that of making the Self fit into the Environment. The former we may call the Inward Will; the latter the Outward Will. By the Inward Will the individual endeavours to subject the Environment to his directive control to form one harmonious system. The Inward Will, therefore, reduces to the same as the Egoistic Will. In the Outward Will, the individual endeavours to put himself into harmony with the Environment, modifying himself and directing his actions accordingly. Since the Mind is in the Self, this movement includes what we have called the Objective Will, by which he strives to get a true picture of the world as a necessary requisite for the unification. It also includes the Altruistic Will, by which the Self is modified to fit in with the envisaged Environment. In what follows, for convenience, we shall speak only of the Egoistic Will instead of the Inward Will and of the Altruistic Will instead of the Outward Will, so that in it is included also the Objective Will.

22. Alfred Adler and his school arrived at two fundamental tendencies in the direction of human activity, which they designated "The Will to Power" and "The Community Feeling." The term "The Will to Power" was borrowed from Nietzsche. Rudolf Allers prefers to use the expression "The Will to Community" as more correct instead of *Gemeinschaftsgefuhl* or Community-Feeling. We note here

that The Will to Power is the same as our Egoistic Will, the former term stressing one aspect of the latter more than other aspects. The Will to Community is the same as our Altruistic Will, the former term stressing one aspect of the latter more than others. When it is granted that the most important part of a man's environment is made up of other men, then the appositeness of the terms, the Will to Power and the Will to Commnnity, may be conceded. However, we prefer our own terms, the Egoistic Will and the Altruistic Will, because in spite of being more comprehensive in their implications they are sufficiently expressive, and, moreover, because we have arrived at them independently by simple deduction from the general tendency to unification. We may repeat, for emphasis, that a unification within a small sphere of voluntary activity may necessitate the extrusion or ignoring of items adverse to the unifying process. Moreover, in such an activity, *e.g.* in attention, willing may be obvious in both of its aspects.

23. Let us now go on to the practical consequences of all that we have said, and in particular to its applications in the study of Character.



CHAPTER XXV

CHARACTER

1. That the study of character is of vast importance is obvious. Recently it has been subjected to systematic enquiry, and the great deal of literature that has appeared since the start of the century shows that due recognition has at length been given to the subject.

2. The object of education is not only to impart knowledge and to provide training in its applications,

but also to develop character; for by it alone is human activity directed. We must point out that to those who deny that man can direct and does direct his behaviour the study of character will have no purport; nor will it have any meaning. Again, a knowledge of the nature of character and of its growth and development is needed in our practical lives. The activities, the attainments, and the achievements of each one, depend in no small measure on his character. Social considerations alone will lead us to examine how each individual will be able to reach his best perfection in the community and also give of his best to the community. Moreover, in order that we may be able to guide another in the practical conduct of his life, and that each one of us should be able to do the same for oneself, the knowledge of character and of the factors involved in it is essential. With one's practical life is bound up one's physical and spiritual well-being. Thus not only to parents and teachers, on whom falls the responsibility for the early formation of character, but also to others who have to do with the care of soul and body, *e.g.* to the priest and to the medical man, is the study of character of primary importance; even, we may add, to those on whom devolves the employment of individuals in the best possible way.

3. Character is disclosed by a man's actions. Although this word includes speech, talk, or conversation, yet we do not rely on words alone but on all the external manifestations to arrive at that inner principle in him called character. We examine, in short, his conduct in order to get an inkling of his character. Consequently all the factors governing a man's conduct go to make up his character.

4. By the term conduct, we shall restrict ourselves in the first instance only to voluntary forms of behaviour; for involuntary movements, *e.g.* reflex

actions, do not exhibit that with which we are concerned, the principle of directed human activity.

5. We must stress here a point to which Alfred Adler and his School of Individual Psychologists have attached so much importance, *viz.* the unity of the individual, which expresses itself in his every act. We do not affirm that the spiritual nature of man is manifest in his every movement, *e.g.* in digestion, etc., but that in a man's every act as such, and in particular that in which his directive influence is manifest, all the qualities of his lower nature also are to be seen. Theoretically, therefore, a single observation should suffice to disclose an individual's character ; but, owing to obvious difficulties on the part of the observer, in practice many observations of behaviour in varied situations and spread over a long interval of time are necessary. This itself implies that we recognise some consistency in an individual's actions and a sort of "common factor", which we set out to discover.

6. Again, we must observe that when we have arrived at something definite, whether from a single observation or by comparison from a large number of observations, all we have got is a type. We understand the particular only from a knowledge of the general. Moreover, though we may put an individual character under one or more types, yet we must grant that it is a unified whole and not a mere aggregate of elements, as we are inclined to believe on account of our discursive thinking and the practical necessity of taking up aspects one by one.

7. In the last chapter, we have indicated that the general urge to unification as expressed by external actions resolves itself into two movements, one directing the Self to the non-Self and the other the non-Self to the Self ; and that the directive activities called the Altruistic Will and the Egoistic Will respectively, are influenced by the relations set up in the Mind, between

the Ego and the non-Ego, in the very setting up of which directive control is exercised. Every action of man affects the world as a whole and also sets up new relations therein. Even an internal action—an adjustment in the Mind, a decision made, an intention set up, an opinion formed, an attitude taken up—changes the world, inasmuch as the Self with its Mind is a part of the world and such a process goes along with physiological changes; moreover, these subjective events are antecedent to external action and as such have a bearing on physical events. The ideal world of the Mind is the joint-product of the Self and its Environment, and it is especially liable to change, precisely because the two factors are subject to change and because of the constant impact of the two changing realities. This ideal world is of some consequence in the world as a whole, because it is in accordance with it chiefly that adjustments are made in reality between the Self and its Environment.

8. Every action, therefore, sets up a new relation between the Self and the non-Self; also between the Ego and the non-Ego, since it provides an occasion for the perception of another impact of the realities which have thereby changed. The cosmic movement may well be described as a ceaseless cycle, from the non-Self to the Self and back again to the non-Self.

9. All men of all ages exhibit certain features in common, i.e. there is a special plan to which they conform and by which they are said to belong to the species Man. The plan is made up of relations, internal and external, potential and actual. When taken as manifested by behaviour it is called Human Nature or the Nature of Man as man. Man's behaviour on the whole shows many close similarities. Just as science brings to light certain constantly recurring events and qualities in the world, embodied in its 'concepts' and 'laws', so also we find in human actions as such close similarities and recurring events

pointing out to some fundamental principle peculiar to human nature and common to everybody. In the individual, with his human nature as a sort of structural base or as a sort of skeletal framework, is built up the individual nature. To it details are added, particular relations fitted on, so that it is individuated and becomes the manifestation of a unique entity, existing separately and unrepeated. Real distinction implies real, *i.e.* manifestable, differences. That aspect of an individual's nature in relation to his externally manifested directed actions is his character. Character is, therefore, unique, *i.e.* proper to the individual.

10. Nevertheless, we must admit that over and above the absolutely common human nature, a group of individuals exhibit several common traits. This is because no one exists in absolute independence and because a group as such has many things in common. By looking for constantly recurring modes of behaviour, for like reactions in like situations, we arrive at the fundamental or primary human traits. The same method enables us to discover secondary or group qualities and distinguish them from the primary ones, and also recognise the peculiarly individual non-recurring traits from the primary and secondary ones. From the nature of the study, however, we are compelled to express the particular in terms of the general. Even the words we use have a universal significance derived from social acceptance, so that all we can do is to reduce an individual character into a bundle of types. However, we can conceive of character as a unique combination of types sufficiently characterising the individual for the purpose on hand.

11. We have already indicated the two tendencies by which unification is to be attained. The Egoistic tendency is evident in biology, especially in what is known as "the instinct of self-preservation". Spinoza expressed this sort of inertia of being in the

axiom: *Omne ens in suo esse perseverari conatur*— "every entity endeavours to persevere in its own mode of being". In recent times, perhaps, it may be said that this does not apply equally to all things, for the radio-active elements undergo spontaneous disintegration, *i.e.* they tend of their nature to split up and transform into simpler elements instead of striving to retain their mode of being. Nevertheless, it is granted to all living things; in fact, it is one of the characteristics of life. The tendency to self-preservation, which is at the same time a self-expression, is seen in photo-synthesis and metabolism and in all other forms of nutrition, in excretion, in growth, in reproduction, in metamorphoses, in responses to stimuli; in short, in a vital movement. Its end is the maintenance of stability against disintegrating influences. Man belongs at one and the same time to all the orders of being, and consequently exhibits this tendency in different ways. When the movements along this tendency are consciously directed by the man himself, then they are characteristically human and individual, and so far they reflect his character. By it the environment is made to subserve the individual nature; the non-Self is put into subjection to the Self, to fit in with its plan, to maintain and develop the Self and give the Self the means of self-expression in and through the non-Self. But self-preservation also requires a modification of the Self, for otherwise it could not continue in its mode of existence in the face of the impact of the non-Self on it. Hence the Altruistic Will is not so much opposed to the Egoistic Will as complementary and correlative to it. Again, the recognition of adaptation as a factor of evolution is a recognition of the two correlative tendencies, the adaptation of the individual to its environment and of the environment to it.

12. Man's environment is in an especial measure the world of his fellowmen; for it is the impact of this world upon him that has the greatest repercussions

on his individual human activities. Consequently, the Egoistic Will and the Altruistic Will have especial importance in relation to this external communal world, in the various forms in which they are directed respectively from and to it. The relations between the individual and the community are of paramount importance in regard to the end for which man strives—"That they be one". The proper direction of these relations, which are envisaged by the individual and by which other real relations are set up consequent on actions, is a prerequisite to the proper direction of man's relations to other beings, for a man's evaluation of these things is influenced by the community.

13. We know that the development of the individual is dependent on and intimately bound up with that of the community. He is dependent for his material well-being, physically and economically, on his fellows. But this dependence is particularly seen in his human life. It will suffice if we mention Speech, Education, Science, Invention, Commerce, Government, etc., social activities, in which the individual is bound to have some share. Without some sort of participation in society his limitations are so enormous that it is difficult to see how he will even exist: he will be automatically eliminated for want of adaptation.

14. We have given the term "Wills" to the two directed movements, for reasons already stated. We may add that in them is the recognition of Significance and Value, and of direction by Knowledge and Love. In fact, the indication of how a perfect correlation may be attained between them, is given by that second positive Commandment, like to the first, to love one's neighbour as oneself, by which alone will "They be one as thou and I are one".

15. That the two Wills may be co-ordinated is aptly illustrated by team work in which the individual

is moved to put forth his best efforts in unity with those of the whole team, in the good of which his own individual good is merged.

16. In itself considered, the Egoistic tendency aims at the making absolute of the individual. This tendency is externally restricted, because the individual's powers are very limited of themselves and because of necessitating circumstances. Internally, however, or subjectively, it has no such limits. The internal restrictions are of a moral nature, but such as do not of necessity limit its range. In its reference to the community, it has been aptly called by Adler, following Nietzsche, as we have said, The Will to Power, and recognized as a fundamental trait of human beings, manifest obviously or masquerading under strange disguises in the lives of individuals and of groups and of peoples. External restrictions are imposed on it by society and by the conditions of the individual's life in it. Without these limitations, it would drive on to absolutism. When fire was discovered at some early date in man's history, the prospect of its uncontrolled use so agitated men that they could only see the intervention of the gods to check man's ambition. That is why Prometheus was tied up. Today, when the immense energy bound up in the Atom has been made public and its tremendous power for destruction when released actually demonstrated, we feel much the same as early man must have felt when fire was discovered. Titanic efforts on the part of an individual, however, are fortunately impossible without the co-operation of a community. Today the progress of science depends to a very great extent on international collaboration. It is to be hoped that its progress will be directed to the good of the whole human race.

17. Obstacles to the Egoistic Will serve not only as a check to its uncontrolled development but also as a stimulus to action. It is activity, directed

by this Will and restricted by the limits of nature as well as of Morality, that has raised man from the state of primitive savagery to such astounding heights of scientific, technical and cultural achievement as make us marvel at the history of the race. Indeed, it is in the facing of difficulties and in the overcoming of obstacles that the willing aspect of human acts becomes clear.

18. We have already in another chapter considered the various classes of human acts. We have classified movements as automatic, reflex, instinctive and impulsive, voluntary and involuntary. We have noted the part played by vital realization, by satisfaction and by pleasure and pain. We have traced the development of voluntary action. We have already observed that all man's conduct, taken in a wide sense, has the same physiological mechanism, least complex in the case of automatic action and most complex in the case of instinctive and higher action. An actual event—an impact with external reality, or an internal change in whatever way it may occur—is the starting point of the movement. In order that the action may be a directed one, the situation to be realized by action must be present in consciousness. The end of an instinctive action is in consciousness primarily by previous experience of a similar action. It is always the realization of some vital value. Once the end is envisaged in consciousness, any fresh action may be consciously directed to its realization. Vital values have an especial power, a sort of vigorous attractive 'force' which is purely subjective; for they are firstly set up by experience proper to the individual, and can only be corrected by objective relations to higher values. An instinctive movement is unconsciously purposive; the end is not set up in its Significance and Value and the means are not chosen in their relations, as conceived, to the end. The movement has no Finality in consciousness; it is initiated as a physiological reaction and proceeds as a series towards its end,

coming into consciousness as it proceeds. In an impulsive action, the end which, as in Instinct, is the realization of a vital value, is envisaged in consciousness; but the movement to it, not being automatically defined, proceeds in a sort of haphazard fashion with no clear perception of its eventuality, the means being ordained to it in a general vague fashion; nor is the end itself viewed in any relation to a higher one. In voluntary action not only is the end envisaged in consciousness but also the means in their order to the end, the end itself not being considered absolutely but with reference to—though perhaps vaguely—some end. It may be that by constant repetition a human act becomes a Habit, losing much of its volitional aspect. Nevertheless, it is derivatively voluntary.

19. It has been necessary to refer to the qualities of man's actions in general, because the physiological constitution of an individual plays a large part in the formation of his character, and because, as we have indicated, the higher aspects of knowing and willing show themselves only in and through his physiological movements—for man, we repeat, is a unified whole.

20. Since Instinct is not consciously purposive, and since both Instinct and Impulse are directed to the realization of a vital value, it is clear that there cannot be either an Instinct to Power or even an Impulse to Power. For Power is a relation apprehended, a Significance and a Value, not belonging to the realms of mere animal being, and not being a mental representation of a physiological experience. The Egoistic Will, as we have said, includes the Will to Power, and implies much more than a modification of any Instinct or Impulse.

21. We differ from Individual Psychology, while agreeing with it on the unity of man's actions and on his undivided nature, in saying that while the lower aspects not peculiar to man are visible even in all his

higher actions, the higher aspects, peculiar to man, are not manifest in all his lower movements, *e.g.* in automatic actions, in reflexes and in instincts, and barely so in impulses. Indeed, it is precisely for this reason that we speak of man's actions as higher and lower and of man as belonging to all the four realms of being. We do not, of course, insist on there being any purely spiritual action in man, for we hold firmly with Adler that in man body and soul constitute one undivided entity in the true sense. Man's behaviour may be classed in any of the four levels, the higher including the lower. Even should we speak of supernatural acts, according to Catholic doctrines, it is because of a supernatural quality impressed on a human act; so that in this case also the higher includes the lower. Nevertheless it would be quite wrong to say that automatic actions, reflexes and instincts, or even impulses, are elements of a human act as such: for a human act, i.e. the act of a man as man, is distinctively on a higher level; nor can the higher be "explained" by the lower. However sublime a thought, it is in some way derived from a sense-image and is dependent on speech, i.e., on word images and their utterance; hence, in spite of its content being of a spiritual nature as a set of relations and more so in its reference to a spiritual world, it is inevitably connected with the physical world as well as with society, speech being but a social instrument of expression.

The Egoistic Will

22. The Egoistic Will is one of the two fundamental factors in the building up of Character. It may be considered to be the same as Adler's Will to Power, if Power were taken in a wider sense, with reference not only to the communal but also to the physical environment. Control over material nature may be said to be directed towards control over others; but with equal justification one may retort that control

over other human beings is directed towards control of the material resources of nature. In any case they are correlative, and history does not show but that they go together.

23. The Egoistic Will is a primitive tendency directed by man, the tendency of adapting the surroundings to the Self, in which surroundings it may assert and express itself. If unrestricted, it would burst all bounds. Fortunately, there are limitations. External restrictions arise from the environment, from its intractibility and resistance. Internal restrictions arise from the subjective limitations, from certain dispositions in him, and from the movement of the Altruistic Will, itself a primitive tendency directed by him.

24. The external obstacles to the Egoistic Will may be summed up thus: firstly, those inherent in inanimate nature, requiring more than the knowledge and technical skill and efforts of a single individual that they may be overcome; secondly, competition with the Egoistic Will of other individuals; and thirdly, conflict with standards set up by society, in its customs, traditions, laws, recognition of values and toleration of modes of singular conduct.

25. This Egoistic Will, being a primal directed tendency of the very depths of individual nature, may be expected to be particularly obvious in the earliest years of the individual's life; the more so because restrictive influences will not have yet gained much strength, as well as because the disguises under which it may appear will be fairly transparent. Experience justifies this expectation. A systematic investigation of child conduct leads to conclusions bearing on the fundamentals of character and on the factors moulding it.

26. Since all human conduct is based on the impact and the relations set up and envisaged between

the Self and the Environment, an enquiry into the specific nature of the child's environment will now be helpful.

27. There are seven distinguishing features of the relations between the child and its environment. They are: (1) the child's smallness, (2) its physical weakness, (3) the unreliability of its knowledge, (4) the strangeness of its experiences, (5) the vagaries of the world, (6) its peculiar situation in a special set of concrete circumstances, and (7) the treatment it is accorded by others.

28. The child's smallness. It looks upwards; it has to be lifted up. This brings up a sense of inferiority; at least a vague consciousness of relative physical smallness that will develop soon into one of metaphorical insignificance in relation to those with whom it comes in contact.

29. The child's physical weakness is brought home to it by its dependence on elders, by the resistance of material things to its efforts, by its inability to do for itself many things that it sees others do, by the watch set on its frail efforts, by the prohibitions imposed on it, by its inability to make itself understood.

30. The unreliability of its knowledge further deepens the sense of unfitness or inadequacy. It is frequently corrected in the generalizations it has arrived at by analogy, *e.g.* in its acquisition of language or in its concepts of things and persons.

31. The child is constantly undergoing some new and strange experience. Comparatively speaking, experiences tend to be accepted as familiar more quickly by the child than by the adult. The child in this respect is more adaptable. This aspect of child life explains why the child is more ready to expect as

well as to experience something new. That is why it is so full of curiosity.

32. The vagaries of the universe as seen by the child also shakes its confidence in itself. It finds that there are too many exceptions to the 'laws' that rise up vaguely in its little mind, so that the universe seems to him to be unaccountable. Add to this the seeming inconsistency in the behaviour of adults, most strikingly apparent in the rebukes they mete out to itself, and we can well realize that to the child everything seems uncertain. This uncertainty is indeed not clearly in consciousness; but as perception widens, uncertainty also increases. Even should some feeling of security arise in its consciousness, it goes hand in hand with an awareness of insecurity. The special set of concrete circumstances in which the child is situated are, *e.g.* its sex, whether it is the only child, its order of birth in relation to the other children, whether it has a step-father or a step-mother, or is an orphan, by whom brought up, its standard of life, caste, community, colour, etc. These circumstances are intimately connected with the treatment it receives from others.

33. The treatment accorded to the child by those with whom it is in contact is of still greater importance. Owing to the uncertainty with which it is surrounded, even in the behaviour of adults, it yet looks up to adults for approbation, for confirmation of its knowledge and notions, for an example to follow, for standards to aim at, for patterns to imitate, and for ideals to be set up. For, just as insecurity is the correlative to security, so also is the vague awareness that adults are superior to it the correlative to its own vague sense of inferiority. The child looks upon adults as a source of knowledge to show it the way by which it, like them, may control the forces of nature. It looks to the adult for evidence of its own potentialities. It also sees in the adult the greatest

obstacle to its desire to handle things. The attitude to the child of adults determines the relations that the child sees as existing between them. There are many experiences in the life of the child that do not seem to have an immediate effect. There is no need to postulate an Unconscious Mind, in which adjustments take place. Once an experience is had it remains in its physiological images and associations; and thus is a potential influence on future mental adjustments.

34. This brief general exposition of the fundamentals of the Self and non-Self of the child is necessary for any system of Characterology. It is not asserted that these relations are clearly outlined in consciousness; but they are implied in experience; from it they are perceived gradually in their implications at least. (A more systematic knowledge is required of the way in which little children picture to themselves adults and those of their own age. Careful investigation is desirable. There is here a good field for research.)

35. Of the six features we have mentioned above, the first five contribute to dispositions of inferiority and insecurity that the child gradually recognises. These are serious internal obstacles to its Egoistic Will. The last feature, the treatment accorded to the child by others, may contribute enormously to the same dispositions or may serve on the other hand as a corrective to them. If the child succumbs to these dispositions, his life is doomed to failure. When directed to its proper goals and developed to face and overcome obstacles, it is the Egoistic Will indeed that renders possible and brings about all personal, historical and cultural achievement. The limitations experienced no doubt curb that Will and keep it from morally and socially undesirable manifestations. But should they, especially in childhood, become so excessive as to prevent its due development, then thereby is cut off at the source all

positive personal achievement and all moral and cultural progress. The Egoistic Will is needed not only for all striving to the good, but also for resistance to evil. By it one becomes an active participant in History, in that forward movement of the human race towards unification.

36. The Egoistic Will seeks for, and uses, the means by which and through which the Self asserts and expresses itself. It provides that self-confidence necessary for initiative and perseverance. It implies the recognition of the Self not merely as existing but also as having personal Significance and Value. It is sufficient that these are implicit in the external relations, and as such perceived without being formally in consciousness.

37. In this effort to overcome the world, to bring his environment under his control, the child is forced to see that he has to modify himself also. He recognizes potentialities in himself, the same as he finds realized in others. He set up ideals, and measures himself against standards; and these ideals and standards are got from his contact with elders. Thus the Egoistic Will demands for its manifestation the working of the Altruistic Will, some sort of conformity of the Self with the world of men, and recognition of belonging to that world. Difference in degree is aimed at, but not a difference in kind. An ideal is set up with a Significance, what one can be, and a Value, what one should be. The setting up of ideals plays a great part in the formation of character.

38. Everything that contributes to emphasize the sense of weakness, insignificance, inadequacy and insecurity, weakens the self-respect of the child and brings about *Minderwertigkeitsgchuhl*, translated in English commonly as Inferiority Complex, perhaps better rendered as "sense of inferiority" or "inferiority-feeling". Although "sense" and "feeling'

are words with many meanings, what we have in mind is neither a "sense" nor a "feeling". It is a vague awareness, based on experience and implied by conduct, of a relation to a value perceived as not being realized in oneself. Conversely, every impression that strengthens the Sense of Inferiority increases the sense of weakness, insignificance, inadequacy, inefficiency and insecurity of the child; so that there is a vicious circle.

39. The sense of inferiority that originates, as it were naturally, in the child's smallness and weakness, may be accentuated by the special conditions of its physical make-up or "constitution", e.g. weakness due to long or severe illness, unproportionate development disequilibrium of the organic functions, susceptibility to ills, congenital diseases and deformities, the bad after-effects of some early accident or even of the circumstances of birth or of ill-regulated nutrition. That the physical constitution has a great bearing on character is beyond question. However, it would be unjustifiable to assert that constitution determines character; for on the one hand there have been profound changes of character without any marked constitutional change, and on the other hand persons pathologically grouped together as of like constitution exhibit a wide range of character. Neither the theory of psycho-physical reciprocity, by which bodily movements are regarded as "causes" of mental processes, nor that of psycho-physical parallelism, by which they are put into correspondence by divine pre-ordainment, gives a satisfactory explanation of the Cartesian Dilemma or accord with the facts observed. But the view that both movements are activities of a living unit made up of body and soul essentially united and operating as one in the metaphysical aspects of Matter and Form, is the most satisfactory and does not raise any dilemma; and modern opinion has veered round to this view. Bodily movements experienced in consciousness

should be regarded not as causes but rather as occasions of conscious action. A person's conduct is influenced not only by his constitution, but also by the relations of Significance and Value that he sets up in Mind; and it cannot be said that these relations are causally determined by his constitution.

40. One does have some sort of experience of oneself as an organism and of one's bodily make-up. Not only do permanent or lingering physiological dispositions, *e.g.* a deformity or a disease, but also quickly passing ones, *e.g.* fatigue, affect our behaviour. Sometimes without any clear experience of indisposition we feel "out of sorts", or merely "not the same as usual". When we discover the nature of the occasion or situation in which this occurs, we find that it is to a large extent in our power to give in to it, or to rise above it. At one time one may *feel* fit and vigorous and ready for anything, and this in spite of the doctor's adverse opinion; at another, one may *feel* languid and depressed and unfit to fight the battle of life, even though one is still really capable of further efforts. One somehow through experience becomes aware of limits to one's capacity for physical effort. The more objective the knowledge of one's limits and of the limiting factors, the less is one affected by adverse results and the more ready is one to face the world. One's attitude to life is in correspondence with that knowledge, for in it is implied also one's capacity for achievement. It has been well observed that the weight of a burden is felt rather as an approximation to the unbearable than by comparison with a lesser one. To know what we cannot do helps us to see more clearly what we can do and also how we can do it. The consciousness of one's fitness has been given the name "vital consciousness" by Adler. It rises up in all our experience; it is implied in all our deeds. In this way does physical constitution have a bearing on what is properly known as Character; for vital consciousness enters into the notion of the Self.

41. Therefore all bodily weakness and misfunctioning and all constitutional defects take away from the individual's sense of security and accentuate the knowledge of his inefficiency and inferiority. Subjectively as a correlative to this knowledge and sense of insecurity and associated with it is a feeling of discouragement, which endangers the normal development of character. Children of abnormal constitution need not only special educational methods but also treatment by competent doctors who are at the same time psychotherapists and recognize in abnormalities conditioning factors of characterological dispositions.

42. We have said that the special concrete situation in which the child is placed is closely linked up with the treatment it receives from others. Consequently the deleterious effects of the former on its sense of inferiority may be enhanced still further—as it very often is—by the latter. Nevertheless, it is by the latter only that they can be effectively countered.

43. The situations for which the child is not responsible but which influence its treatment by others, are its sex, whether it is the only child, its order of birth in the family, whether it has a step-father, or a step-mother, by whom it is brought up, who are its playmates, the social level of the family, caste, community, cultural tradition, colour, creed, etc., whether the child is illegitimate or born before marriage or born of adultery or of divorced parents.

44. It is said (Cf. R. Allers in *The Psychology of Character*) that a very large proportion of neurotics and hysterics is made up of three classes: the only child, the eldest child, the youngest child. Again neurosis is more frequent among women than among men.

45. Since the family is the immediate environment of the child, its treatment by its parents, nurse,

or teacher, is of consequence. Noteworthy features (as enumerated by Allers) are: (1) unequal treatment of brothers and sisters (*i.e.* favouritism or neglect, excessive severity or undue mildness, cruelty or pampering); (2) inconsistencies such as alternating severity and leniency; (3) bad example on the part of the guardian; and (4) also the custom of entrusting the elder children with the upbringing of the younger, or at least delegating to them some share of the parental authority.

46. It will be out of place in this work to go into detail in regard to the havoc wrought in the life of the child by such influences; nor have we the space to indicate how the ill-effects of the constitutional and situational factors may be counterbalanced by education and a proper attitude to the child. A certain amount of "inferiority-feeling" is natural and inevitable, or we might say normal in a child, and is even good, inasmuch as it sets reasonable bounds to the Egoistic Will. Without restrictions the Egoistic Will would demand obedience of Nature, as Canute is said to have ordered the waves to obey him; or would exact worship from human beings, as the Roman Emperors are even rulers of modern times have done; or would attempt a conquest of the world, as so many have done.

The Altruistic Will.

47. We have now to consider that other factor in the building up of character called the Altruistic Will. It is the Will to adapt the Self to the surroundings. When referred to the social environment, it is the will to enter into this world, to become part of and to take one's place in human society.

48. Alfred Adler used the term *Gemeinschaftsgefuhl*, which may be rendered as "community-feeling". Rudolf Allers proposes the term "the Will to

Community" instead, because in connection with character formation, we are dealing with an 'actively adopted attitude', 'active conduct', or behaviour directed towards a definite goal. It is certainly distinct from the "sense of community", or "herd-instinct", just as the "sense of power" is distinct from the "Will to Power". We prefer, however, to use the expression "the Altruistic Will", not only because it is more general, but also because it is sufficiently expressive and shows its origin and its relation to the other will. There is no doubt, however, but that in regard to the Altruistic Will the environment of primary importance is that of one's fellowmen. The associated feeling is one of familiarity with our fellowmen and of strangeness out of society.

49. The recognition of communal ties for the full development of the individual is certainly not new; but to Adler is due the credit of bringing the communal factor once more into prominence. To the Egoistic Will, as we have said, pertains the biological tendency of self-preservation and self-assertion, or, in short, of adapting the Environment to the Self. This tendency is common to all living things, taking different forms as we ascend the scale of life. To the Altruistic Will corresponds the biological tendency of adapting the Self to the Environment. In its reference to other members of the same species the tendency is one of associating together, called the "herd-instinct" or the "social instinct", and is exemplified in gregarious animals and better still in community-forming insects. In this aspect, the tendency is not universal. However, in man, the tendency to society seems to be not only a peculiar trait but also a fundamental and characteristic one. Aristotle held that the best description of man was "political animal", by which he meant the same as what others later meant by "social animal", i.e. capable of actively organizing itself into a society. The individual's dependence on his fellows to attain psychical

maturity and in so many ways, particularly in the matter of speech with all its implications, is sufficiently obvious not to require amplification. Robinson Crusoe would have perished on his island if he had not taken with him the knowledge he had acquired in society. Not only is man dependent on contact with his fellows for intellectual development, the acquisition of knowledge and its applications, but also for the development of "moral personality". In man the tendency to society is not fixed in its mode, or invariable, or hereditary in its details, like instincts; but it is directed. Moreover, it is becoming more and more obvious, as modern inventions are making man's interdependence more and more complete and inevitable, that, unless the tendency is directed and directed properly, the race will wipe itself off the face of the earth.

50. The Altruistic Will needs to be developed, so that the individual may participate fully in the conditions governing man's life on earth, and take his due share of duties and responsibilities in life.

51. The moral goal of the Egoistic Will is the manifestation of the Self, the expression of personal significance and the assertion of personal value; that of the Altruistic Will is the attainment of personal significance and value and the development of the modes of manifestation by contact with the world. For the former is required the urge of Love of the Self; for the latter the urge of Love of the World and particularly Love of One's Neighbour. The two wills are reciprocal and interconnected. One cannot be properly developed without the other; the individual's life would be lop-sided. If he were wholly absorbed in the community; he would lose his individuality, shed his personal value and significance, become incapable of expending himself for the community, and his love would lose its creative efficacy; consequently he would fail to attain the goal of the Altruistic Will.

He can love another only in the manner in which he loves himself. If he were, on the other hand, wholly engrossed in the Self, he would be incapable of attaining to that moral and cultural level necessary for any sort of leadership or for the bending of others to his will, thereby failing to attain the goal of the Egoistic Will. His love of the Self is supported, elevated and refined only by love of his fellows; indeed, without charity he would hate himself. It is in the equilibrium of the two primal tendencies, developed and directed by the individual, that strength of character lies. As Fichte pointed out, the Ego and the non-Ego come into consciousness together, and the personal "I" comes into being only in relation to the personal "thou". We see this clearly in the manifestation of the mind of the child, who calls itself "Baby" and takes some time before it can use the first personal pronoun. It perceives other selves before it gets as conscious of its own self. It somehow senses the emotions, moods and attitudes of others long before it is reflexly aware of its own. Even a dog seems to be aware of the moods and affections of a man, or rather to respond to the subtle manifestations. For any sort of exercise of the Egoistic Will the individual must develop in himself just those powers which he cannot exercise by himself alone; and for any sort of exercise of the Altruistic Will he must have a just appreciation of himself. That man should depend on others for his physical existence, learn from others, develop by contact with others, take commands from and be subject to correction by others, give and take in his dealings with others, and modify his behaviour with reference to others, seem to be inevitable consequences of his nature. Anarchy carried to its logical outcome would spell the death of the race. A human leader of a human herd must himself be a part of the herd; while an individual, however abject he may be, will not be driven always, for, as he would say, "even a worm will turn".

52. It is the Altruistic Will that conditions the individual's contact with his fellows and directs his attitude and relations to them and the mode of his dependence on them. The more he strives and feels himself to be a living member of the community by voluntary adjustment, the less will he resent the limitations to the Egoistic Will imposed on him by the community: for on the one hand he sees that they are not peculiar to himself and on the other that there is plenty of scope for its proper development and exercise, provided he takes an objective attitude to life, viewing himself and others in their true proportions, and correcting into objectivity the significance and value of things. Thus only will he enter actively into the dynamic equilibrium of society. Thus also is created in him that psychological attitude, which as a virtue is termed humility and is just as opposed to slavishness on the one hand as to Egotism on the other. We may justifiably say that morality is founded on the very nature of man. In the equilibrium of the two wills alone will be found the roots of the virtues of humility and charity, and a clear realization of one's obligations to and responsibility for oneself and one's fellow-beings.

53. The hedonistic doctrine (Egoistic) that man, both in his individual and his social life, is moved and cannot be expected but to be moved by personal considerations of pleasure and pain, not only takes the lowest view of man but also involves a contradiction: that we can think or expect otherwise would itself need explanation. The totalitarian doctrine (Altruistic) that the State or Society is supreme and that morality is based on service to the community involves a vicious circle and is founded on a subjectively formed one-sided conception of the universe.

54. Let us now expound briefly Adler's principle of compensation and over-compensation, and consider some of its consequences.

55. When the bob of a pendulum is pushed aside and released, it moves back towards the position of equilibrium; but it goes even further, and it is some time before opposing factors stop it and turn it back towards the stable position. Thus there is set up an oscillation. In several chemical reactions also there is a state of dynamic equilibrium with a net result: the movement goes beyond the point of equilibrium, and then oscillates about the point. If a movement goes beyond an equilibrium, which is unstable, it carries on further towards another equilibrium, and if this is stable, it will oscillate about it. Such ideas may be carried over by analogy to psychology, but the analogy must not be carried too far. Thus impulse is in general directed towards "satisfaction" and to the pleasure accompanying the process; and it is said to come to rest with the attainment of its object. To some extent, this is true of the eating and drinking and sexual urges; but, even here, one generally finds the movement carried to excess. Again, in our passions, *e.g.* anger, fear, one is often carried beyond the equilibrium point. Oscillations of various sorts have been discovered in biological processes, and variations about a mean. We wish here only to note that no physiological movement, nor even a psychological one, comes to an abrupt full-stop, but proceeds some way beyond the satisfying point. There is a form of pleasure, called in German *Funktionslust*, "the pleasure of right functioning"—by 'right' we mean 'with all the parts in harmonious equilibrium.' The impulsive action directed to it is certainly not brought to rest by the pleasure generated, but gets out of this pleasure a new stimulus to action. The pleasure of exercising power and the pleasure of creation, are also of this sort; so also the pleasure of study, of discovery, of creation, and the pleasure attendant on other forms of functioning. If the movement is brought to a halt, it is not by the attainment of satisfaction of impulsive desire, but by other attendant physiological conditions, *e.g.* fatigue, as in the case of the play impulses. The same is true of the

impulses of self-preservation and self-assertion. To have escaped from danger can only be a negative source of pleasure, if at all, and that by retrospection. In any case, there is not the pleasure of the satisfaction of any impulsive desire, nor does it stop the impulsive movement. Hence it is not true to say that all impulse is based on pleasure. Pleasure is only one of several possible goals of impulsive action, and it shares with them the quality of realizing in experience a definite vital value.

56. There is also a biological principle which has been transferred to psychology by Alfred Adler. In simple language it is this : if an organ is inefficient, the organism tends either to stimulate that organ to greater activity or to increase the efficiency of other associated parts of the organic system so as to compensate for the defect, raising the total operative capacity to the normal level, and even to overcompensate, raising the capacity to a higher level ; if, however, the organ is irretrievably damaged and fails to heal, then connected parts are affected adversely, so that the whole constitution deteriorates. A blind man may have his sense of hearing or of touch highly developed. Every organ is improved by activity—up to a limit ; when inefficient, an associated organ is stimulated to greater than its normal activity and consequently improves above the normal. This principle, based on sound biological and pathological grounds, expresses the "finalistic" point of view now common in biology, *viz.* the unconsciously purposive nature of organic functioning. When transferred to human conduct in general, it may be enunciated thus : If vital consciousness or sense of physical fitness is reduced, not, however, below a certain limit, the immediate result will be a tendency to compensate for it by self-assertion and even to overcompensate by exaggeration.

57. This principle makes it possible to interpret instances of normal and abnormal conduct which

would otherwise be difficult of interpretation. The successful application of the principle by Adler points to its soundness and strengthens the case for the consideration of man as an organic whole. It does not imply, however, that man's higher conduct can be explained in terms of purely biological laws; rather does it show that his lower tendencies and movements are the material in which and though which the characteristic traits of man may show themselves.

58. If the vital consciousness is excessively diminished, then the tendency to self-assertion is decreased and ultimately destroyed. Provided this is not the case, the diminution provides a stimulus to the Egoistic Will, to increased efforts of self-assertion, to climb up the ladder and to shine.

59. Bodily factors that result in diminished operative capacity may be either constitutional weakness or misfunctioning or even defective growth. *e.g.* smallness of stature and physical deformity. Julius Caesar, Prince Eugene of Savoy and Napoleon were short men; Hitler was impotent; the late F. D. Roosevelt, President of the U.S.A., bore the effects of infantile-paralysis. Demosthenes, the stuttering Athenian youth, became a renowned orator. Mendelesohn, a hunchback, excelled as a musician. Examples of defectives who made themselves notorious for sadistic cruelty are innumerable. A boy deficient in studies may try to excel in sports and vice-versa. A child of well-to do parents, but of poor abilities, may tend to become snobbish, etc. Thus the principle may be extended. The inferiority experienced need not be only in the physical plane, *i.e.* arising from bodily defects alone.

60. The examples cited bring out two points. Firstly, that compensation is sought for in the same sphere as that in which inferiority is experienced,

as in the case of Demosthenes; and if it is not obtained there, it may be sought for in another sphere, just as the sense of inferiority itself may be extended from one sphere to another. Secondly, the sense of inferiority may not have a wholly objective basis; it may be in great measure subjective, arising from the attitude to the individual of others and the subjective interpretation of that attitude. The special success of the Jews in certain particular avocations may reasonably be traced to the treatment they receive from others.

61. The Egoistic Will must not be weakened or extinguished by an excessive sense of inferiority. Hence the advice of the utmost importance to education may be given: Do not draw a child's attention in a disparaging way to any defect for which he cannot be held responsible, *e.g.* poverty, caste, social status, colour, physical deformity, weakness, defective growth, etc. lest he lose all confidence in himself. On the contrary, Do all you can to bring a child to a just appreciation of his Significance and Value not only as a human being in general but also as a particular individual with special abilities which it is in his power to develop. It is highly desirable that he should get into the category of those who can and know that they can, rather than to belong to the category of those who can and know not that they can, or of those who cannot and know that they cannot, or of those who cannot and know not that they cannot.

62. Character must develop normally, *i.e.* as the principle of behaviour directed in harmony with the world of reality in its widest sense. The child finds itself in a situation of natural subordination. This is unalterable by any of the child's efforts and is to be passively accepted and taken as a matter of course. Subjectively, the position is appreciated as one of inferiority. The scope for compensation is very limited, but its working out is very palpable: the

child seeks to be the centre of attention; it wants to be taken notice of; to be made much of. Up to a certain extent, such behaviour is to be expected and allowed for; but manifestations which show that development is taking a turn away from reality and life are undesirable and should be held as portending an anomaly.

63. Play is an important activity of child-life. The child gets aware of its physical potentialities, co-ordinates and develops its muscles and sense-organs, gets into contact with and learns about material things and other children. So play is a preparation for life. It is an activity by which surplus energy is expended; and more than this, it provides and is directed towards the pleasure of right functioning. Also, it may give the occasion for exercising both the Egoistic Will as well as the Altruistic Will. Again, it is a mode of compensation for the inferior position of the child. Each little one always likes to play the grown-up. Illustrations of this point are in plenty. Quarrels arise as to who should play the mother, or the teacher, or the bishop, or the captain, or the coachman, or the engine-driver. Boasting of what one's father, or elder-brother, or uncle, is or can do, is common. If play is properly supervised, a splendid opportunity for character-training will be found in it.

64. Besides the compensation sought for in games, there is another one which is easily got in dreams and fantasy. Fantasy, or a flight of fancy, takes the day-dreamer into an imaginary world in which all the obstacles to his striving and the worries of the world of reality are either missing or replaced—by "wishful thinking"—by their opposites, and the individual is the centre of importance, crowned with success and glory. The world of fantasy is at the beck-and-call of the dreamer, who is its omnipotent creator and stage-director. In it even the normal restrictions to

the Egoistic Will may be absent. In it all unsatisfied desires can be satisfied. In it one finds refuge from the cares of life, and full compensation for the sense of inferiority gnawing into one in the world of reality.

65. For the child there is not very much difference between one world and the other. It tries to realise the events of the dream-world; and where this is found to be impossible, their fulfilment is put off to the indefinite future—when the child's "day" comes.

66. But with children, as also with adults, there is not merely compensation, there is also overcompensation that is sought for. The child dreams of himself not only as a grown-up, but as a great grown-up, the greatest he can imagine.

67. This overcompensation in fantasy, due doubtlessly to an abnormal sense of inferiority, raises to inordinate heights his aims for the future, and will inevitably plunge him proportionately deeper into the depths of misery later on. It is the difficulties of attainment and of achievement of real life that sharpen the wit, strengthen the will, and keep one's aims within the realm of possibility; not by putting off, however, the encounter, saying "Wait and see when I grow up" but by overcoming whatever can be overcome at once. To put off is indeed wise if it is due to an objective estimation of facts and possibilities, knowing that the end is to be attained by preparing the means to it first.

68. Neither is it wrong to desire a thing ardently. What is wrong is to be unreasonable in the desire; not to see that its fulfilment would affect others adversely and oneself also; or that it would imply a position relative to others far in excess of one's merits or of others' dues, so that it could not be tolerated; or that the desire is of something impossible or impracticable in itself at an ytime, like crying for the moon

What is wrong is also the manifestation of the desire in the form of a demand of another, as if the good behaviour of the child were dependent on the desire being complied with. Stubbornness, yelling, beating the mother, are such undesirable manifestations, which, if not checked early, will soon become very difficult to deal with. Conduct should be good for its own sake, irrespective of whether one's wishes are gratified or not. Disappointment is felt when a wish is not granted. When this is inordinately strong, expressing itself in anger or affliction or moroseness, it is because of the expectation that the world of men and things would always bend to one's will. If the expectation is based on some sort of a sense of distributive justice, it may lead in the long run to cynicism. The child's first environment is the family, and in this circle "making fish of one and flesh of the other" is to be deplored on account of its ill-effects both on the favoured as well as, and more especially, on the neglected child. Will any one say that it is good for the child to be realistic and know early that all men are sinners and that it cannot ever expect to see justice in this world? Few will desire that the miseries and brutalities of the world should be presented to the child in their stark nakedness; much less that it should experience them. There is no need, on the one hand, as in course of time every individual will come across them; and on the other, such realistic training fails in its object, for the child will become unrealistic. The good has to be presented to him; it is just as objective as the bad, it alone is worth striving for, and by it alone the human race is kept up; and if it is rarer, it is precisely for this reason that it needs more presentation. The child's education is for training it to strive for the good, *i.e.* face and overcome difficulties in seeking for it. Evil shows itself; the good has to be sought for. The child naturally seeks for it and expects it in others. If it is obscured by the bad, the child's natural tendency is soon perverted. Moreover, in the family circle he is guided by authority and

example in others. Bad example is easier to follow. There are no obstacles to evil, except what is imposed by others; but these do not necessarily check, they may merely be avoided. The child would only try not to be found out in an evil action, understanding by it only that which will bring about punishment. Before development of its reasoning powers the child is apt to consider all the actions of its elders as models for imitation, and cannot discriminate details of good and bad. Moreover, only the good in others can arouse love in the child.

69. We have said that the abnormal Egoistic Will would demand that the Self be Lord and Master of Creation. Man is a god, if only he knew in what sense; but he would be God. In order that the unrealistic striving of the Egoistic Will be tempered, the individual's Altruistic Will must be correspondingly developed, so that he may take his due place in the world in accordance with his objective subordination to the laws of reality. Then only will he be a "Man of Good Will", voluntarily subordinate to that which is and which nothing can alter, re-adjusting the views and aims that held sway in his world of childhood fantasy, one with the community and an active member of it, succouring others and finding succour, giving and taking, loving and being loved. In society he will be freed from any excessive sense of subjective inferiority and of egoistic isolation, and even make up for his own impotence by the good-will of others. In society only will he recognise that the impotence he finds in himself and is not responsible for and cannot alter, is part of the very nature of man, the common lot. Thus it will lose its emphasis in his subjective sense of inferiority and no longer harass him or take away from his sense of personal significance and value. Indeed, in the community he learns the nature of man and so learns himself, and in it he realizes his personal significance and value.

70. Society somehow enters into the life of the individual. It is in his very nature, as Aristotle said; he is born a life-member of it. The child has to learn to appreciate that membership and accept it. It must be brought home to it in its experience, by contact with and participation in society. Not being centred round the Self like the Egoistic Will, but radiating from the Self, the Altruistic Will needs to be fostered and developed; whereas the Egoistic Will needs only to be on the one hand checked from the anomaly of exaggeration and on the other preserved from extinction.

71. Historically and naturally the first society is the Family. In the environment of a rightly directed family, the education of the child is most effective. Unfortunately, too often is the family misdirected or even undirected. Consequently, it is frequently desirable that the child be removed from it and placed in an educational institution. This, however, is an artificial family, a poor substitute, though the best possible one in the circumstances.

72. The earliest years of life are the most decisive for the development of the individual and carry indelible marks into his conduct in later life. Freud has rendered a service in stressing this point, though he has laid undue emphasis on the sexual urge. The first six years of the child's life are of the utmost importance in the moulding of character. But it cannot be said that in these six years it has been formed; only the seeds of it have been, as it were, sown, and the ground prepared in the environment of the home. After this age, the responsibility of the elders and of the teacher is not by any means small. Much watching and weeding and trimming and training has to be done.

73. The child first experiences society in the family circle and enters into it and is bound to it with the bond of love.

74. The relationship that keeps society together in an active equilibrium is of five types: (1) I and my parents, (2) I and my children (3) I and my married partner, (4) I and my neighbours, (5) I and God. Unless the family life is ordered according to objective principles, the child's Altruistic Will will not develop normally.

75. Between parents and children, the attitude must be one of mutual trust and confidence. The distance between parents and child must not reach exaggerated proportions; and the child, far from feeling itself to be only something being brought up as a subordinate whose duty it is not to inconvenience or annoy its parents, should have the respect due to it as a human being and a living member of the family. A child must not be ordered but requested; it may be given reasons for what is required of it and induced to accept cheerfully its share of work in the family. Any manifestation of subjective omnipotence and omniscience, of Egoism, on the part of the parents does as much harm to the child as harshness, injustice, waimsicality, moodiness or even drunkenness.

76. Respect and mutual devotion between husband and wife provide the strongest foundation of the family. Every marriage should be reckoned as an equal partnership mutually entered into for sacred ends, to be kept up by love and duty. In society one must recognize also the fundamental equality of all men as human beings; to view another as below that common level is degrading even to oneself, whereas to see always the best in another is elevating and encouraging and consoling. The relationship of man to man is a universal brotherhood, and the moving principle is love. The ideal attitude is the same as to oneself: 'Thou shalt love thy neighbour as thyself.'

77. My relation to God is one of utter dependence. The formal acknowledgment of this is a duty

I arrive at by reasoning. In my actions I have to express not only that I am child of God (in a general sense, at least) but that I am one of many, who are equally children of God, that the whole world of matter and of life is the work of God, and that my objective relations to every one else and everything else are fixed thereby. The attitude to God and to the world, inasmuch as it is His, is to be one of humility, recognizing both the greatness of the Almighty and the dignity of the Self and the goodness of the work of His hands. The Egoistic Will begets the Egoistic attitude and the feeling of Pride; the Altruistic Will is by itself inclined to slavishness and the feeling of insignificance. When both are developed proportionately, then only is there true humility and an objective appreciation of personal significance and value. Pride has been called the root of all evil. It is an element of Malice as well as of Lust, Anger, Covetousness and Envy. Pride enters subtly into many of our attitudes and actions, even in such as may outwardly appear to be moved by humility and love; but it is not so hidden that the individual cannot discover its traces for himself.

78. The development of the Altruistic Will is hampered by several circumstances, which may be summed up as those that show up the child, on the one hand, or society, on the other, generally in an unfavourable light.

(1) The more the experience of personal value is weakened, the more difficult it is to enter into a membership of active participation in society. (It must be noted, of course, that the Egoistic Will and the Altruistic Will are only abstractions or partial aspects of one and the same thing. Hence there is no contradiction between them or any real vicious circle.)

(2) The more unfavourable the aspect in which society is allowed to appear the weaker the desire to

enter actively into it. Injustice, inconsistency, hatred, malice, tyranny, kill the love necessary for social life.

(3) The more isolated and excluded the family is from a wider society, the more difficult is it for the Altruistic Will to develop properly. On the one hand class and communal and racial and religious prejudices may keep a family practically cut off; on the other, the unsociable egoistic nature of the parents may result is seclusion or in a constant grumbling and quarrelling with neighbours. The child to whom neighbours are represented as bad or low cannot develop a genuine love of its fellowmen and may even lose some of its natural confidence and courage and fight shy of facing the world; nor can the child who belongs to a family despised and shunned by its neighbours.

79. Membership of society has to be experienced; social life must be learnt and the start is never too early. All exclusiveness or ostracism is detrimental to character. Some parents keep their children from associating with others out of pride or jealousy or excessive anxiety; they really do more harm than good to the child. Good-will is responsive to good will, though, no doubt, it is its glory to shine in the midst of evil.

80. A child should associate with its equals as much as possible, so that it will also experience life as it should be among equals. The association should be supervised—at a distance—so that the Egoistic as well as the Altruistic Will may both be exercised proportionately in the situations created by this association, and undesirable manifestations checked. Such association will on the one hand counteract any excessive sense of the child's inferiority, and on the other check Egoism by the clash with the Egoistic Will of others. Too often is education in the family circle defective; but experience shows that children, and even the only child, can be well prepared for life in a

properly regulated family, and that when grown up, they can themselves direct a family on right lines.

81. Work is an activity by which man fulfils his natural obligations. Man is a worker and a co-worker. He takes his place in society and joins in the struggle not only for the existence of himself and of others but also for those extra benefits that the material world will not give until it is beaten to it. It implies the adaptation of the physical world to the needs and purpose of the Self and of society; but it also implies the adaptation of the self and of society to certain conditions of fitness.

82. Work is activity directed to the creation of values that endure beyond the activity itself. Values themselves are set up ultimately by society and, as such, work has a connection with society. As a creative outlet of energy, as a concrete expression of the Self, as an assertion of one's mastery over matter, as an opportunity of service to others, and as a means of earning a reward, work may give pleasure and satisfaction. But it is different from play, inasmuch as it is in the last instance toil. Moreover, it is a duty by which one enters into active membership of society. Granted that it is accepted wholeheartedly as such, the "yoke becomes sweet and the burden mild". To the child, as to the adult labourer, work must not be presented only in the aspect of toil or an unjust oppression, but as a dignified duty from which pleasure may be derived in the exercise and satisfaction in the fulfilment It is not the place here to investigate the relations that should subsist between employer and employee as a consequence of this aspect of work. It is sufficient to point out that the position is analogous to that of the parents and children in the family; and that if a labourer is to give his best it is essential that he must maintain his sense of personal value.

83. To the child work must not be represented as an oppression to which the child in particular is

subjected, or as a curse to which all men since the Fall have been under. Rather should it be associated with the pleasure of functioning, the pleasure of creation, the pleasure of acquisition of knowledge, the pleasure of achievement, the pleasure of realizing personal value, and the satisfaction of appreciation by others and of fitting one's Self actively into the family. This may be aimed at, whatever the nature of the task allotted to the little one. It serves also to lessen the distance separating it from adults, and to instill in it self-respect, confidence and courage.

84. Collaboration evokes sympathy and renders possible understanding, while these in their turn make collaboration wholehearted. To create values, one must learn to recognize values created by others. In collaboration this is to be had. Since values cannot be created by what is worthless, their recognition implies that of personal values. By work the individual makes real his personal value, and by it the latter is freed from much of its subjective element and is corrected.

85. Sex is another inevitable condition into which the child enters. It is connected with certain dispositions and situations bearing on the formation of character, and consequently must be given special treatment in a volume by itself.

86. That the individual suffers also by the conduct of others would emphasize the fact that we are responsible collectively in a general way for the upbringing of the members of society. The effects of errors in upbringing and in attitude to little ones on the part of parents, teachers and other adults, are never restricted to one aspect of life, *e.g.* the physical or the mental or the moral aspect; for man is and manifests himself as an undivided entity, acting and suffering as an indivisible whole. Errors cannot be

altogether avoided, but they can be lessened by taking note of the possible consequences.

87. According to the "*Milieu* Theory" man's individual nature is determined solely and entirely by environment. While not minimising the importance of environment as a factor, we assert that the person plays just as decisive a role in the formation of his own character; indeed, character as the guiding principle of conduct is the reactive response of the person to the environment, the relation of the Self to the non-Self set up by the Self, conditioned largely by their contacts and by the extent of the variability of each.

88. It may be safely assumed that every individual can develop in more than one direction, and that in each direction there is one path—at least one—that leads to the most favourable development. Which is the direction and which the path and how far the development may go, can only be known from actual experience—*post-factum*—but indications may be sought for and will certainly be found for guidance. It behoves us than to make every possible effort to direct the child placed under our care (and even with whom we come into contact) along the path that will take him to his fullest development.

PART IV

CHAPTER XXVI

INTROSPECTION

1. The oldest method of Psychology is Introspection. That it is not purely subjective can be seen from the fact that many of the conclusions of the ancients were accepted and are still accepted. The individual is the "object" of examination as well as the observer. He can look at his actions in a detached manner. When he subjects his thoughts, feelings, desires and motives to inspection by retrospection, he is no longer at the mercy of his passions. He can be in some measure impartial; he can even see his own meanness and pride, the unworthiness of his motives, the rashness of his judgments, the spite and jealousy he was subject to: in short, just as he can act as accuser of himself as accused, so also he can be an observer of himself as observed. The objectivity of his investigations is strengthened by comparison with those of others, and by their acceptance. In general, the observer in most intimate contact with the observed, and therefore in the best position to know, is himself. That is why we sometimes advise a person to calm himself and think matters over.

2. We do not say that introspection is easy or that the subjective element can be altogether eliminated. But for the purposes of psychology there can be recourse to comparison of results and to the general verdict, and so some satisfactory results may be obtained.

3. Since, however, there are apt to be interpretation on the part of the "subject", personal emphasis on certain phenomena, and the arousing of new thoughts and feelings, it is necessary that introspection

should be methodical and that the person should be helped in maintaining a detached point of view and refrain from interpretation. This is all the more important in General Psychology, in which we are striving to study man in general. When the character of the particular individual, his peculiarities and individual reactions, are to be investigated, then the reactions of the observer to himself as observed will themselves have significance to a third party, who is properly speaking the experimenter and to whom the client's report can be very objective.

4. Objective methods have been in use for a couple of centuries in Experimental Psychology. Investigations were carried out on reaction times, and later on accuracy and quickness of perception, on retentiveness of memory and on learning.

5. Such methods were not monopolized by any one school; nor was introspection altogether eschewed. It happened, however, that just as the value of introspection was being altogether denied at the end of the last century by a new school that was rising up, there was also developing a systematic method of introspection. Its field was expanded, a new technique instituted, and its aims more precisely formulated.

6. Many psychologists at the end of the XIX century adhered to introspection as the primary method of psychology. Out of these emerged a school that sought to refine the method, make it precise and free from the objections usually raised against it, so that it would be as objective as possible; at the same time they did not belittle other methods. Some denied that introspection could ever become objective. "Objective" methods were used from the start in the laboratories of the last quarter of the XIX century, *e.g.* in the study of reaction times, the degree of accuracy of perception and learning and memory. The field of introspection itself was extended.

7. It must be remarked that the phenomenon of "negative-after-image" has to be accepted, although the evidence for it rests entirely on the evidence of each individual in respect of his own experience. It may be considered as objective precisely because it is common experience and commonly agreed to.

8. Introspection has been rejected by some on the ground that it is "subjective". It is a case of giving a dog a bad name and then a kick. Let us see in what sense it may be called subjective. The method depends on taking the report of the individual on his own experience. That the individual examines his own impressions and reports on them to the investigator is some justification for calling the report or the psychological facts "subjective"; but the sense of the term is not exactly the same, not co-extensive with the term as properly used. If we should use it, however, we should imply other things; that the individual was influenced by preconceived ideas and prejudices; that he had motives; that the nature of the situation in which he found himself, the presence of the investigator, the purpose of the investigation, and such considerations and circumstances, affected his observation of himself or affected his report. But is this of necessity so? Cannot all these influences be avoided? Cannot they be avoided at least as much as they are avoided in the so-called "objective" methods? For in any case such influences may act on the individual's behaviour also as observed by the investigator; this can easily be seen to be the case in many instances. Moreover, we cannot eliminate the investigator, the weight he gives to different data, and his interpretation; and a subjective tinge may arise from this side also. It is uniformity of results obtained from a large number of varied experiments conducted by a large number of investigators that ensures objectivity. And this sort of objectivity can certainly be attributed to introspectional methods. In fact, if it were not so, we

could not claim to have had any psychology whatever till this century; nor could any one say that we have much of it even now, for strictly "objective" psychologists are few in number and their results are not at all so universally accepted as to be called objective.

9. The impressions observed by the person examined may be "impersonal" to him, *i.e.* of no consequence to him other than that he is doing his duty or obliging the experimenter or advancing the pursuit of knowledge by subjecting himself to examination and reporting his impressions. He need have no motive to make a false report; he need not be highly strung or excited by some previous incident or some recollection or wandering in his attention. He may report quite truly that he sees or does not see, hears or does not hear, tastes or does not taste, feels or does not feel, smells or does not smell; that he sees "green" or feels "warm" or hears a high note, or gets a bitter taste or that two things put near his nose have the same smell. He is required to report only on his sensation, not to make any judgment on the nature or existence of any external object. He can lay aside any personal significance. Such a condition is required even in "objective" experiments. For if the impression is clear and well-defined when we make an observation, we accept readily the external reality as causative of it; when it is dim or vague, or when later we find the fact disputed, we repeat the experiment and even enquire into the sense-impressions themselves. Methodical introspection has no more requirements for objectivity than the "objective" methods. When a doctor examines a patient he has to accept something of what the patient says. He cannot say that in every case the patient is a hypochondriac or is malingering. When I tune in the radio-receiver carefully, everybody is in general satisfied with the reception. A scientist depends on the reports of his research assistants, and these are in most cases

reports on their sense-impressions. If he does not rely on himself as the standard of accuracy in virtue of his training and experience, he has to rely on someone else. And the reliance in any case is on sense-impressions reported on by the one who experiences them. We may have automatic recorders, sensitive pointers, etc., but ultimately we have to depend on sense-impressions and on reports of them. In fact, since this is so, the assistants themselves are first subjected to tests to estimate the degree of accuracy of their observations. More than this, " personal equations " are worked out and allowed for to attain to the highest accuracy possible; and all this can only be done if the assistants report and report truly on their sense-impressions.

10. The objectivity attained by methodical introspection is certainly as high as that claimed for any other method. For the tests are the same, viz. agreement of the results of a large number of independent experiments carried out by a large number of independent experimenters.

11. It must also be noted that the subject's report of his experiences to the experimenter may be objective to the latter—if he looks at it dispassionately or in a scientific spirit. The subjective element noted in n. 2 above is precisely what has to be investigated.

12. For those who say that we only know our own sensations and ideas, all the data of all the sciences are properly speaking subjective; for they are in the first place, our sensations of sight, hearing, etc. Even the device of not trusting a man's direct evidence, but of getting the evidence indirectly, from phenomena, by taking photos or using recording apparatus, does not get rid of the subjective element, except in so far as the records are available for examination by many others and human interests can be eliminated by the verdict of the many and each one

has to "use his eyes". Light is radiation as it affects me through my eyes; sound is vibration as it affects me through my ears; each sensation is for me my cognition of a physical phenomenon. The late Sir Arthur Eddington admirably explained how scientific observation is reduced finally to visual sensation, the motion of a pointer against a dial, and to "readings". We cannot reduce it to anything less, and sight is the most perfect of our senses.

13. Having reduced all observations in Physics, Chemistry, Astronomy, etc. to sight-impressions, scientists make them objective in the manner mentioned above. The observer firstly has to render himself unbiassed in his observations, say, of the markings on the planet Mars, or in his fine measurements and records. The automatic methods of recording by photography and time-recorders further eliminate subjective elements. Introspective methods become objective in precisely the same way. The person experimented upon is in the same position as the laboratory assistant who is asked to put down his observations, with no comment thereon or speculation on their causes, or interpretation of the facts. In ordinary life each one may be the observed, the observer, and the interpreter, all put into one. I am convinced that the "negative-after-image" is not actually on the wall, because I find that it moves about against the background as I shift my eyes and that it quickly fades away, and chiefly because others say that there is no coloured form on the blank grey wall. Ordinarily also we avoid interpreting when the impression itself is faint or vague, and we seek for corroboration of it by others.

14. If Introspection, rendered objective in this manner, be rejected, then all scientific observation should be rejected on the same grounds.

15. A chemist first tests his reagents to see whether they are chemically pure (or he accepts the word

of others or of a firm of repute in the matter) and then uses them to test other chemicals. So also he tests his assistant to see whether he is reliable in observing, whether his vision is to be trusted; when satisfied he relies on his assistant's reports. They are taken as objective. While the assistant was being tried out his observations were of the same type as now when he is confirmed; but the chemist first used the observations made by the assistant to test the assistant, and now he uses them to test his specimens. In the same way an astronomer tests his new assistant first, and then has to rely on his reports. He works out the " personal equation " of the assistant (the reaction-time); he uses it to render the observations still more accurate in much the same way that he allows for atmospheric refraction, parallax, instrumental errors, errors of adjustment, etc. Just in the same way also any registering instrument is first tested against known phenomena and then the known instrument is used to test unknown phenomena. In a psychological experiment the person tested is such an instrument; the investigator tests him against known stimuli, using the subject's report to indicate what is going on within him. When Binet made up his " Intelligence Tests," he first tested the tests against known subjects, viz. children accepted by many as normally developed for their ages. These are like the 'checks' used in general scientific work. In this way a person's colour-vision is tested by an investigator who is himself not deficient in this respect. A colour-blind person is like a person using defective instruments. The investigation of the nature of the defects is of great value. Moreover, a person who matches grey, bluish-green and reddish-purple is of no use for certain purposes; and one who identifies the various tints and distinguishes between different shades of the same tint is said to have normal colour-vision, because his reports agree not only with the stimuli applied, as known to the investigator according to their wave-lengths and amplitudes, but also with the reports of very many

others, including all those who have been thus tested. When A calls an object "blue", he reports an impression received as similar to the impressions received from other objects which others called blue. As such also the report has an objective value.

16. Every sensation is referred to an external object or to something extrinsic to the organic unity of the individual as causative of it. Even the 'after-image' is but the effect of waste-matter—therefore extrinsic—not yet eliminated from the neural zone. If A reports merely that he sees blue and not that he sees a blue object, it is because he has been told not to make a reference to anything outside himself.

17. That Introspection involves memory does not invalidate it as a method. The subject makes a report *soon after* having received an impression. There is little loop-hole for lapse of memory. That man does exhibit memory is itself a psychological fact and its investigation is incumbent on psychologists. Moreover, its use should not be objected to, seeing that it is involved in all our knowledge and without it no science can stand. It can be made objective in the same way. That illusions and hallucinations are possibilities, does not argue against Introspection, just as it does not invalidate the results of the physical sciences. That there is a great deal of agreement in the results of introspection is obvious to any unbiassed person. Lack of agreement comes of course with speculation on the origin and nature of mental life.

18. It was known for a long time that a mixture of red and yellow gave orange, a single sensation. In the same way a chord struck on a piano gives a single sensation, but a trained person can single out the tones. We can by attention follow out the movements of any one instrument in the orchestra. In this connection, it is marvellous to note what the human ear can do. It sorts out the wave-lengths from the complicated aerial

wave-formation that impinges on the ear-drum, and it follows out the succession of notes made by any one instrument. No mathematician of the highest order can make such a reduction in mathematical terms. A better understanding of the nature of light and sound and the progress made also in Chemistry and Physiology, led to a new method in psychology early in the XIX century. It was the method of **Stimulus and Impression**. A stimulus was applied to a sense-organ and the subject had to report on the impression it made on him. The psychologist conducted the experiment on himself first, and then on others, and consistent results were accepted as facts. In this way many scientific (or objective) facts were established. The method was in use all through the XIX century and still is. The notion that sensations could be reduced to their 'elements', just as chemical compounds could be split up or mixtures sorted out or "white" light dispersed by a prism into its constituent colours, moved psychologists to the search for irreducible elementary sensations by this method. By exploring the skin in detail it was discovered that there were little spots that reacted to warmth, others that reacted to cold, some that gave sensations of pain, others of pressure. Thus the impressions given by the skin were found to be four, warmth, cold, pain and pressure. Moisture, dryness, roughness, smoothness, hardness, softness, stickiness, were blends of these.

19. In the same way by plugging the nose to keep odours out, the number of taste sensations were reduced to four: sweetness, sourness, bitterness and saltiness, and to blends of these or of these with the sensations of smell, or touch. Thus a sweet drink may be a blend of sweet and sour (tastes), of cold (touch) and of an odour or flavour (smell). The impression seems to be one, but is actually sorted out into elementary sensations. Of course, it was long known that we can attend to one quality of a sensation, *e.g.* we can compare two drinks and say which is the sweeter, or

which the more acid or bitter or salty, or cooler or more strongly flavoured.

20. The impressions of sight are reduced by analysis to six elementary sensations: white, black, red, yellow, green and blue. The impressions are innumerable and are spread out in space, giving form and location. The suggestion of movement in a succession of pictures projected rapidly on a screen, the removal of anomalous suggestions (*e.g.* of a car moving forward while the wheels rotate backwards), the synchronisation of talkie-films, these require the method of Stimulus and Impression. This method also reveals the fact of negative-after-images, which cannot be accepted except on the subject's testimony and the comparison of reported experiences.

21. The sense of hearing has a very large number of elements, for each tone is an element. However, there are innumerable blends also, *i.e.* sound-impressions reducible to their elemental tones. With a tone goes also its overtones, and different combinations of these give different qualities to the tone. The characteristic qualities of a musical instrument as appreciated by 'the ear', are found to depend on blends of overtones with the fundamental tone sounded on the instrument. In speech any speech-sound emitted is found to be a blend with a fundamental tone produced by the vocal chords of accessory tones produced by the other "organs" of speech, lips, tongue, etc., together with their overtones. The analysis of auditory sensation has been of great value to makers of musical instruments, telephone, talking-picture and radio engineers, and even to acoustical designers of musical halls. The method of analysis involves the control of the stimulus by the technique of Physics and a comparison of the reports of the impressions received by trained and reliable persons.

22. Impressions of smell have at last been subjected to analysis, the success of the method

depends on the individual observers carefully following out instructions, which are:—to avoid thinking of things as sources of the different odours presented, simply to compare them by noting similarities and differences and intensities, and to arrange them in a series. In this way certain odours are fixed upon as elementary and others as blends. We have here another illustration of the attempt to look at one's own impressions objectively.

23. In the same manner, aesthetic senses have been subjected to analysis, but the results are not so definite. The individual has only to report which of two objects is the more pleasing to him and to arrange several objects in a series.

24. The method of impression has lately been adapted to the study of the process of comparison by sensation. Thus a person having lifted two weights in succession reports which to him felt lighter than the other, and the investigator also compares the external manifestation of effort spent in each case, *e.g.* one weight comes up more quickly than the other. The individual, however, when asked to report whether, when lifting the second weight, he had any sort of "recollection" or "feeling" of the first, generally had nothing of the sort to report: he could only say that he felt a readiness for the second effort. It seems to be the obvious conclusion that the first effort resulted in a muscular adjustment by which he was ready to expend the same amount of effort in the second, so that if more or less effort were actually needed he would feel the second weight as more or less than the first. In the same way, it may be said, those who have been trained to it can estimate weights, or lengths, or volumes, or numbers to a required degree of accuracy; a cigarette packer counts up ten cigarettes just by the feel of the lot in his hand, a person can use exactly the amount of effort to just jump across a ditch, a tennis-player times his stroke and adjusts the impact correctly, and so on.

25. Thus there is in these cases no such thing as a "mental image", if by this were meant, as certainly used to be meant, a representation in consciousness. There is rather a "setting" or "an adjustment", or "an attitude" in the individual that is not necessarily in consciousness.

26. We may note, however, that ultimately it resolves to a case of physiological impressions. The effect is not only on the muscles but also on the neural system, and the persistence of the adjustment is physiological memory. For a comparison, however, which he was asked to make, the subject must have an image of his first sensation in mind when he lifted the second weight. He reported that he did not have any "image" in mind, *i.e.* he did not and could not recall how the first weight felt after he left it down. This does not show that an image was not brought up when he lifted the second, though just before that he had none. In the same way when I see an object and call it "blue", the image of blueness is revived. It was not there just before I saw the object. Some persons, by practice, *e.g.* grocers, are able to judge weights with a fair degree of accuracy. The muscular adjustment theory does not explain this, unless one holds that the grocer has many muscular adjustments persisting together when he judges the weight of an object. The image may be in me in its physiological counterpart though not in my consciousness, unless and until it is aroused. It is easier for us to have visual images in Memory or Imagination than sound images—for a musical genius the reverse may be the case—However, it is difficult for us to imagine odours, tastes and touch-sensations. They seldom occur even in dreams. Such images require a present odour or taste or touch to be recalled. I have a drink now. I recognise it as iced-lemonade. I did not have an iced-lemon for some months. How did I recognise it? How do I know that the cook has put more salt than usual in the food (as I verify by investigation)? Is there a

muscular or other physiological setting of "saltiness" that has persisted since I last took food? And what about settings for other tastes, etc.? In some cases, it seems certainly better to say that any such setting or physiological plan is re-formed by attention to a new impression, and in others that the plan is one of images and also feelings associated with a former setting.

27. We ourselves would not altogether deny "images", for it is easily seen that a setting can, and sometimes does, bring up a mental representation, as in dreams and day-dreams. This is more particularly true if we do not claim that the setting brings up an image of itself; more often it brings up an image of that to which the setting is directed; and such images cannot be denied. Association also can now be correlated with setting. "Ideas" and "images" are associated by the setting which each gives directed to the next; for not only may a setting bring up an image, but an image may also bring about a setting. Moreover, a setting is a relation towards another state, physical or psycho-physical; and this relationship must not be overlooked.

28. To G. E. Muller, a rival of Wundt, who established a laboratory at Gottingen, is due this concept of a setting. He used the German word *Einstellung* for it about the year 1890.

29. It is not only the method of impression that we may vindicate, but introspection in general. Indeed, if by the introspection of thinkers of different ages we have acknowledged several mental processes, and if these have been accepted as common experience, then we have attained some degree of objectivity; and it is only experience to the contrary that may overthrow such results.

More than this, we have to accept not only mpressions as facts, but also very often

judgments based on those impressions. No astronomer will think of asserting that an eclipse of the sun reported as having occurred at a certain place and a certain time several centuries ago, was only an optical illusion and that we should not accept the judgment that there was an eclipse, precisely because it is a judgment and not a mere report of a sense-impression. Still more, we have to accept certain facts on "authority". Otherwise we should learn nothing, have no sciences, no history; and our everyday lives would become impossible.

31. Even those who vigorously denounc eintrospection as a method rely on it in their practical lives. Their tenet, however, spells intellectual anarchy,

32. We wish to reiterate the fact, however, that far from being entirely discarded, Introspection is now very much to the fore, that it has become methodic, and has led to many useful result. Acoustical engineers, telephone, cinema, radio and television engineers, are guided by results got only by introspectional methods. Literature, art, architecture and music, have only to depend on introspectional criteria. It is only by Introspection that one can understand others and have sympathy with our fellows. Thus only we appreciate the dictum : Do unto others as you would have others do unto you. Even Behaviourism cannot escape from Introspection, for only by it we know that we behave.

CHAPTER XXVII

SOME MODERN INTROSPECTIONISTS

1. G. E. Muller of Gottingen (1850-1915) set up a laboratory after Wundt. His experiments gave him the idea about 1890 of *Einstellung*—a setting or an adjustment. He widened the method of introspection by admitting the subject's report not merely of the momentary impression but of his entire experience. While Muller was experimenting at Gottingen, another German Psychologist Ebbinghaus (1850-1909) had been conducting investigations on Memory. He noted down the times taken to learn a certain lesson and the times taken to relearn it after specified intervals. He avoided introspection. With his data he drew "Oblivescence Curves" and interpreted his results in the manner of the Associationists. Muller would not accept the interpretation. He requested his subjects not only to learn and recall to mind but also to report their full experience of committing to memory and bringing back to mind. In this way he discovered that they were not merely passive recipients of the material presented, allowing it to evolve by association in their minds, but that on the other hand they were very active in the process, grouping, relating, comparing, contrasting and understanding it. Even nonsense syllables or random series of digits were learnt in groups of two or three with a rhythm given or suggested by the sounds. One subject with a prodigious memory for figures could repeat even fifty digits after looking at them once. It was discovered that from early childhood numbers had always had a great fascination for him, and that he had learnt or found out for himself many of the relations of numbers. He knew all the prime numbers up to three digits and could quickly detect larger primes. When he saw a three-digit number, its factors at once came to his mind, or some peculiar property, *e.g.* if it was a square or a cube, or the sum of squares or cubes, or if it was very close to a number with such an

interesting property. He grasped the series of digits in groups of three, each group giving him a number he was familiar with, and, further, he grouped the groups. Muller discovered that in memorising most people do the same, using groups and noting familiar relations and meanings. Thus memorising is an active process. Muller also discovered that his mathematical prodigy had but a poor memory for other things.

2. We must note that the subject was presented with a series of written or sound symbols. If each does not convey a meaning in itself, then it is only a rhythm or melody that may be suggested by the sequence of sounds, and the rhythm or melody image persisting will recall the sounds in series. If each sound has a meaning, then we look for a meaning of the whole sequence. If they all fit in together into a whole, the significance of the whole once grasped enables us to recall the symbols in their order. In this way we remember the words of another in ordinary conversation. If the terms in succession do not fit together, building up into a more and more complex, yet united, idea, then perhaps a common relation between the successive terms or between these terms and a familiar series, will help us to retain the series. Thus almost any one will remember the series, 2, 4, 6, 8, 10, 12,.....to any number of terms. All that is required is that the series of digits given should be grouped in sets as shown by the commas above; the first term, the last term or the number of terms, and a relation noted. The relation in the above is that each term is two more than the previous term, or that it is the next but one of the familiar series of "natural" numbers. To learn a series as a whole, there must be something binding it into a whole. In the case of a few digits (up to six or seven), we can retain them without much mental activity, because the sight or sound images in their sequence may persist for a time in us. But even here we must not overlook

the fact that there is Attention, and that the greater the Attention the greater the persistence of the image. The subject is requested to attend to something; to oblige you he does it. He may even find the material presented to him interesting.

3. Alfred Binet of Paris (1857-1911), who invented a system of measuring "Intelligence", took up the study of thought-processes and worked upon the reports of his two young daughters, thirteen and fourteen years of age. The result was that he gave up his earlier opinion that reasoning was but an interplay of images, and came to recognize "imageless thoughts". He came to the negative result that thinking did not consist in the mere manipulation of images, or at least that there may be clear thinking with but the vaguest of images.

4. In the meanwhile Kulpe (1862-1915), a professor at Wurzburg (and later at Bonn), who had studied under Wundt, and his students set to work at the same problem. Marbe (b. 1869) a colleague of his, investigated the process of judgment. Judgment as a performance was defined by him to be a response that may be characterized as true or false, *e.g.* an answer to a question that may be correct or incorrect. Not satisfied with performance, he wished to investigate the experience of the subject in the process of judging. He put simple questions and asked for reports of the subject's experience. They often gave prompt answers and had nothing to report. Sometimes they reported confidence or hesitancy and doubt. Marbe invented the term *Bewusstseinlage* ("lay of consciousness", "conscious attitude") to describe the experience. Buhler (b. 1879) repeated the experiments of Marbe, but tested his subjects with difficult questions, so that they might have more to report. He confirmed Binet's conclusion of "imageless thoughts" as well as Marbe's "conscious attitudes." Buhler showed convincingly how introspective

methods could be made objective. The experimenter has to study the thought-processes of others not of himself; he himself must not introspect. He arranges the situation with its stimuli and assigns to the subject the task of noting his experience alone and reporting it. Thus the experimenter sees through the eyes of his subject. The subject, however is not told the purpose of the experiment or what he is expected to report. He only provides the raw data on which the investigator works.

5. Ach (b. 1871), also once a student of Kulpe, made experiments on reaction-times but not as mere performance-experiments. His subjects were asked to report their experience. He discovered that the will to move, the expectation, the setting of the muscles, the determination to move at once on receipt of the stimulus, were all there before the stimulus was given. This preparation for the stimulus was the experience reported. There was little experience to report between the stimulus and the response that came automatically.

6. Watt (1879-1925), a Scotsman, also member of the Kulpe band, went on further. The preparation of the subject was the getting ready to give a word with a meaning which has to be in a definite relation to that of the word given by the experimenter. Thus the stimulus was a word and the response was to be a word. The relation might be *e.g.* opposition ("give the opposite of.... ..."), or Similarity ("give another word for...."), or that of Part and Whole ("name a part of....."), or "give the name of a thing of which I shall mention a part..... "name a species of the genus.....") A short time was allowed for the preparation. The preparation was very efficient in most cases and the response came quickly. The subject reported experience in the period of preparation. If he was new to the task, he had much to report. In his preparation was an attempt to grasp the significance of the task,

e.g. by instancing examples to himself. If the stimulus or the required response was not a familiar word, he experienced hesitation or doubt between the stimulus and the response. With familiar words and with practice, the preparation itself tended to become automatic.

7. Both Ach and Watt concluded that the preparation for a reaction, the 'set' or *Einstellung*, as Muller called it, was very important. The "fore-period", or time-interval between the preparatory signal and the stimulus was therefore one of greater effort and more active experience than the "main-period", or time-interval between the stimulus and the response. Ach and Watt also confirmed the 'conscious-attitudes' of Marbe and the 'imageless-thoughts' of Binet.

8. The Idealists grasped upon the concept of "imageless-thoughts," and spoke of them as if they were spiritual 'thought-elements'. This aroused strong antagonism early in this century. The Existentialists denied imageless-thoughts; the Behaviourists rejected Introspection altogether; the Gestalt School gave up the practice of reducing mental processes to elements.

9. Prof. R. S. Woodworth, of Columbia University, has brought out a splendid book *Contemporary Schools of Psychology*, (Methuen). In it he reviews the origin, work and tendencies of each school in an enlightened, unbiassed, appreciative manner, hoping that in time all their results can be co-ordinated and unified. He himself accepts, on the strength of his own experiments, the findings of the "Kulpe group" of psychologists, though he grants to the Gestaltists "that no good purpose is served by speaking of a 'thought-element'." In the above and in the sequel, we have made ample use of his valuable work, and we acknowledge sincerely great indebtedness to its clear

exposition. His *Psychology: a Study of Mental Life* is also a book of great value.

10. We shall now go over what the Associationists have done, whether of the idealist or of the materialist fraternity. The crux of the whole difficulty that they have to contend with, is the connection between two thought-processes: how does one bring up the other? The Idealists considered thoughts as elements of a spiritual nature, which connect up or associate somehow: according to the Innatists by innate ideas to which they are related; according to Kant, by "forms" of the mind or "categories" in which they are placed by the mind; according to others, by logical relations. They propounded several theories of a psychological or a logical nature. The Materialists refused to accept the spirituality of thoughts; they rejected the assumption of Mind as a spiritual entity—Mind was but the phenomena of thought-processes. They conceived them as purely physical processes, and sought to find the connection holding the two thoughts together. The discovery of "imageless-thoughts" shook them; but they soon recovered by showing that the subject could not be independent of word-images in his thought-processes or at least of rudimentary muscular-movements of the speech apparatus. Their difficulty is to find the connection between the stimulus and the response. This connection has to be a physical one; moreover, any conscious directive activity has to be denied or the whole case for Materialism will have to be abandoned.

11. In the case of man, the connection could not be found, and there was no possibility of finding it except by introspection. By simplifying the process and rendering the response almost automatic, the difficulty was not overcome; for the Preparation could only be properly investigated by Introspection. By treating the Preparation as a Conditioning, *e.g.* with respect to dogs, certain physical connections have

been established, in regard to certain phenomena, but the results do not at all explain human behaviour. The question remains: how is one thought-process brought up by another? What is their connection? What is its nature?

12. Let us suppose the experiments of the Kulpe psychologists had been reversed: first a word is given to the subject. We may call it the Preparation Signal. Then the experimenter tells him what to do. This is the stimulus. The answer is the Response.

13. This method as well as the other is often expected of mathematics students. We are strictly required in Analysis not to form pictures. The only sort of pictures or images that may help are symbolic ones. Other than these, there are no images. The thinking is of the "properties" or "laws" of numbers or of functions. The mathematical "entities" themselves are to be thought of as operands or as operators or as operata, as the case may be. Here is an example:—

Teacher: "Take the number 144".

14. This is the Preparation Signal. The pupil does not suspect what will come next. His atttention is drawn to 144. The image in his mind is the sound-image or the sight-image brought up at once. He feels that the number is familiar. He expects an arithmetical question.

15. In the pause that ensues, his mind ranges over the place-values of the digits or some of the properties of the number. He does not know whether 144 is to be operated upon by another number, or whether it is to operate upon another number, or whether it is to be reduced to an operator operating on an operand. His expectation is based on the mention of a number, and, since it is a class in Arithmetic, his mind wanders

over some of the aspects of 144, whether as an operatum or as an operator or as an operand; the familiar ones come up. The more time allowed him (provided his interest and attention are sustained), more aspects come to his mind. This is the Preparation. If the time given is too long, he will perhaps go on to new aspects of 144.

Teacher: "What is its square root?" (Stimulus).

16. If the "square" property of 144 had come to him in the Preparation stage, the answer is prompt. If not, after a little time (perhaps very little) he gives the Response, *i.e.*, the Main Stage is longer. If he is not used to such a question, he will need more time to run over squares rapidly in his mind before he gives his answer; so that the interval between the Stimulus and the Response is also an active one.

17. Suppose the teacher had said instead: "How often does it occur in Scripture?" This being totally unexpected, and not prepared for, the pupil is at an utter loss. The different aspects of 144 vanish at once. He cannot give any answer. He is dumbfounded for a time.

18. The Kulpe method made the Preparation Stage the one of greatest experience (mental activity, we should say). The reverse method suggested above shifts the experience to be reported more to the Main Stage. In either case, the difficulty is not solved. The same question crops up in any part of the experience: What is the physical connection between two thought-processes coming one after the other? By reducing the Main period to a minimum, the experience reported in it does not give a clue to the nature of the association. The investigation has to shift on to the Preparation period. In Mathematics it is easier to see that any concept is a set of relations. If I think of 144, it is as a set of relations in which the number is involved. If the teacher had said: "Take

the number x", then the set of relations that constitute a number in general (the "Laws of Number") will, given some time, rise in my mind, were there anything more than the mere sound-image or the symbol-image. These relations are self-consistent, and they co-ordinate into a plan. The whole of Arithmetic, nay, the whole of Mathematics, is a very vast plan, in which each concept is a small plan taking its place in the whole. These relations have no direct pictorial representations. The sight-images of the symbols are not the concepts. The thinking over them does not consist in just picturing the symbols in the mind. No doubt such images aid thought; for they hold the Attention, they aid Memory, they help to form mental habits, they influence the succession of thoughts. But the interplay of images, their coming up one after the other by any sort of physical association, is not a thought-process, properly speaking.

19. Most often the subjects in the experiments referred to did not report Interest or Attention, or the grasping of Significance or directive activity. If at all reported, it was ignored. Both experimenter as well as subjects were biassed against Free-will or Spirit. When there are prejudices, such experiments are failures. They are no more objective than the older methods of Introspection.

20. The word 'this' implies a relation of space or time to the speaker; 'man' implies a set of relations; 'merchant' implies social relations. The judgment, This man is a merchant, is a synthesized relation of relations, or a plan made up of detailed plans.

21. We have already referred to *Einstellung* or 'setting' as a physiological plan of images and feelings. A new impression adjusts it into a new plan, or rather fits into the plan. In thinking experiments, the *Bewussteinlage* or conscious attitude is also a plan, not of images and feelings alone but also of thoughts.

The expectation is of something to fit into the plan, a detail to be given by the stimulus-word. It fits in by its relation to the other details. The response is such a relation.

22. The external relations of each kind of atom were known by their activity fairly well thirty years ago; but scientists, *e.g.* the late Lord Rutherford, went on to the structure of the atom, *i.e.* its internal relations, and thence on to the relations between the structure and the external relations. The set of internal relations is the *res in se*, the "thing-in-itself", its plan, as objectively known. The set of external relations is the "nature" of the thing, in the plan to which it belongs. Both together comprise and their relations constitute the whole plan as comprehended by the scientist. In the same way in Biology, Science discovered cells, which entered into the plan of the living thing; then it went on to chromosomes, which entered into the plan of the cell, and lastly to genes.

23. Experimental Psychology seems to have forgotten that there are such things as concepts. A study of the historical evolution of the concepts of Mathematics as well as of the concrete sciences is desirable. It must be objective. Such a study, we do not doubt, will provide many clues to the solution of the problems we are interested in.

CHAPTER XXVIII

THE EXISTENTIALISTS

1. Existentialism traces its origins to the work of Wundt in the last century. He and his followers found a formula to distinguish Psychology from Physics. This was necessary, as it was seen

that the primary data of both were sense-data of human observers. Physics, they said, considered sensory experience in its reference to external things; whereas Psychology considered it in its reference to the experiencing subject. One formula was that in Physics experiences are taken as indicative of facts lying beyond themselves, while in Psychology we consider the experiences just for themselves. Another formula was that Physics puts the experienced facts in relation to each other, while Psychology refers them to the experiencing individual.

2. Thus the subject-matter of Psychology was set down as the individual's experience, and its aim as the description of that experience. Its method was to analyse and classify experiences. The individual was to be looked upon not as a performer but as an experiencer. Introspection was to throw light upon the performance. Wundt himself, though he employed Introspection, demurred at the way in which it was used by the Kulpe group at Wurzburg. He declared it unscientific. A typical scientific observer, *e.g.* an astronomer, he said, is trained and is ready and set for a particular observation. Other observations incidental to the main task are unreliable. Introspection is a good aid to the method of Stimulus and Impression; but gives no reliable results in the study of thinking. If you ask the subject in advance to note whether he has certain experiences, you are directing his thought-process, which otherwise would be variable and unpredictable. An observation cannot be repeated, for the thought-process cannot recur; the subject has been influenced by the first experiment; he has the answer in mind; his experience cannot be the same. Moreover, in the Wurzburg experiments the subject has a complicated task; to think, to judge, to memorize, and at the same time to observe all his experiences. Buhler, who had confirmed Marbe's 'conscious attitude' as well as Binet's 'imageless-thoughts', replied to Wundt's criticism that in practice it was

found that the subjects actually had little difficulty, and that the results of different experiments gave a good measure of agreement, and were sufficiently consistent to justify the conclusions, *i.e.* he claimed 'objectivity and consistency'.

3. Edward Bradford Titchener (1867-1927) was a pupil of Wundt. He introduced the methods of Wundt and of Muller into his laboratory at Cornell University, U,S.A. He was an ardent introspectionist, but he refused to admit 'imageless-thoughts'. He believed that there was a serious objection to it. In ordinary conversation we generally refer to objects, and to objective situations, and do not report our feelings or sensations. This is an ingrained habit, he says, and cannot be helped, even when we are subjects in an experiment, asked to introspect and report our experiences. We report what our thoughts refer to and not their content. This error in reporting has been called "the error of objective reference". Titchener said that only by prolonged training under a strict experimenter can such an error be avoided in introspection. The subject is required to forgot all significance and value and not to refer to anything other than his experience. The experimenter tries to pick out the sensory elements that constitute the subject's total experience. Sensation alone is the fundamental fact, and by it all behaviour can be explained.

4. Let us now make some observations. If the subject had said: "I had a sensation, the same as I had on the last occasion", it would seem as if the subject were only reporting a sensation with no objective reference. But if all the implications be examined, it will be found that objective reference cannot ever be avoided. There was a last occasion; there was a former experience; there was the same experimenter; there was an experiment; there were impression received from outside, etc. We may say that the subject has attempted to see himself

objectively or to make an objective report. Titchener's objection itself is an acknowledgment that the Axiom of Realism is universally accepted and therefore objective. It needs a perversion to be got rid of. Moreover, even if the subject refers to objects, as in common language, he does disclose his experience as he has had it. Titchener's objection to the use of Introspection as an aid to the investigation of experience on the score of the 'error of objective reference', does not hold; for this error is itself the subject's experience. At the worst, the error only complicates the position for the Idealist or the Sensist. Titchener's training of his subject is a conditioning. He would restrict unduly the mental activity of the subject. With his tutoring the subject would either avoid mentioning the objects and objective situations that came to his mind, or, if he bore the experimenter's injunction in mind, his thought-processes would be influenced thereby and he would resort to circumlocution.

5. Titchener's objection to the methods of the Kulpe group was due to their findings. He would not have 'imageless-thoughts'; they could not be reduced to sensations.

6. Indeed, language itself is a social instrument of intercourse; which it could not be, unless it had objective significance. It is true that introspections in which we make objective references are not suitable for a minute analysis of experience. However, they disclose performance in thinking. For the Existentialists it is only the experience that counts, not the performance. They believe that by limiting the investigation to experience alone Psychology could hope to find a place alongside the physical sciences. There should be no extraneous considerations, no personal values, coming in. They must forget significance and value; else they could not expect to attain to objectivity. They have ample material to work upon in the results of the Method of impression regarded as kinds

of elementary experiences. Having analysed sensations, they might go on to synthesize the sensory elements again into complex total experiences.

7. Existentialism dates from about 1910 when Titchener definitely revolted from the findings of the Kulpe psychologists after a heated controversy had raged over the so-called "imageless-thoughts".

8. American Existentialism is not a system of Psychology, except in so far as it only outlines a programme for investigation and restricts the method of investigation.

9. It was Socrates who set out to "prick the scientific bubbles of the day" by teaching men to look for the truth within themselves rather than in the objective world. Thus he boosted up Introspection, and Dr. Jung might therefore call him an Intravert. But Socrates insisted on an analysis of the mental content, which mental content was objectively attained and to be examined objectively. Thus he was no Subjectivist. Moreover, his aim was to draw attention to the importance of knowledge of the Self, which was just as outstanding as the non-Self. In this respect he was an Existentialist in a rather wide sense. He was, therefore, a rebel against the doctrinaire fashion of his age; and Existentialism has always been a protest against Intellectualism. So also is it now; but it is tainted in many ways, and tainted by that same intellectualism or rather rationalism against which it has always protested.

10. The great Danish philosopher Soren Aaby Kierkegaard (1813-1855) was also a rebel against the rationalistic tendencies of his day. Dr. Jung would call him also an Intravert. His discussion of ethical and aesthetic ideas was based on the absolute dualism of faith and knowledge, and of thought and reality. His chief earlier work is *Euten-Eller* (*Either-Or*, 1843).

In his last years, especially in his *Ojeblikke* he denounced the theology and practice of the State Church on the ground that religion was a matter of the individual soul.

11. *Either-Or* begins with the study of "the Individual's existence." The first stage is the aesthetic sphere, in which despair is concealed beneath pleasure. Kierkegaard goes through all the stages of existence, up the scale of intensity, and formulates a tripartite scheme under which he orders and controls his vast resources of psychological material. Since Philosophy strives to see everything *sub-specie aeternitatis*, it is not in touch with Reality. So Kierkegaard takes as his criterion the individual's relation to Time. The Aesthete lives in the moment, striving to escape from Time, Reality, Fate. The Ethical man breaks with Fate, choosing to come to terms with Time, and reaches his maturity through duty and continuity. The "Individual" or Religious man lives in the "instant", *i.e.* the "fullness of time", when the eternal comes into time and man exists before God. Thus the Individual becomes contemporaneous with Christ, that is with the Incarnation, when the Eternal came into Time. The hierarchy of existence describes the intensity of Love, for ultimately Existence and Love are the same. The life of love can only be led by the Individual who lives in "the instant", which embraces all time, giving no predominance either to the past or to the future. Kierkegaard differentiates between Religious Love and Aesthetic Love. Religious Love is a command bound to the "instant" by ever-living religious tradition; Aesthetic Love is that of the poets, a *coup de foudre*, bound to the moment by abstract aesthetic ideals. "Any one who does not live either poetically or religiously is a fool," is a theme on which Kierkegaard continually harps. Either the abstraction of Ethics or the tradition of Theology. Believing that Philosophy, and Ethics are incapable of supporting a way of life

man being confronted by the choice between religious existence and poetical existence, Kierkegaard put up a strenuous fight against Rationalism on the one hand and Mysticism on the other.

12. Kierkegaard completed his spiritual teaching in 1846. (*Final Postscript*) He set down his framework of thought in polemical opposition to Hegel. In the next two years he underwent, as he says, a 'metamorphosis'. He was no longer subject to despair or feared life ruled by Fate. He did not, however, alter the scheme of existence—*la condition humaine*—that he had described, illustrated, and analysed; but he saw it under a new aspect. Existence ruled by Fate, was now through Faith replaced by Divine Providence. (Hence the title of his autobiography *Syns Punketformin Forgattervirksomhed* (the point of view of my work as an Author, published posthumously). Divine Providence from this time became the principle coordinating his life and work and penetrating the darkness of melancholy that had driven him to despair. He rose up "from inborn dread to faith." Kierkegaard's spiritual doctrine may be summed up under three headings: Contemporaneity in the instant with Christ; Prayer, a complete silent surrender to God; the Individual as the instrument, through Love, of Divine Providence.

Thus Kierkegaard came back to the traditional way of life, the surrender of the Self to Divine Providence.

13. Kierkegaard was therefore an Existentialist in the sense that he studied *la condition humaine* and sought for a way of existence. His return to the traditional spirituality of the West, was, as he said, a return to "existential thinking." He may be considered to be the Father of Continental Existentialism.

14. In France, Existentialism is rather a way of life than a philosophy, or, as it is in America, a psychological objective and method. Whatever form

it may have, the way of life sought for must have, however, an underlying philosophical bias. It is in novels, plays and criticisms, that Existentialism expresses itself, rather than in formal treatises. It is now *a la mode* on the Continent.

15. There are two schools of thought, that of M. Jean-Paul Sartre and of M. Emmanuel Mounier. Both reject tradition; both are realists; both are concerned with *la condition humaine*; each expounds a way of life; and both are revolts against the prevailing doctrinaire system.

16. M. Mounier seeks for a permanent aspect of human life in its course through the ages. He protests against an exclusively intellectual interpretation of life. He accuses the rival school of ignoring the true nature of subjectivity and objectivity, and himself takes up a personalistic and spiritual view-point. M. Mounier, whether mistaken or not, regards Kierkegaard's Individual as incapable of being part of a species, as a closed world, as a subjectivist set up in opposition to the non-Self; so that there is no such thing as 'man', and no God either. In systems of thought, says Mounier, we ignore the anguish of reality and escape from the responsibility of our condition. Thus Philosophy (Intellectualism) is escapism. Anything that can be thought is immediately reduced to an abstraction; and existence cannot be thought. Thus Philosophy can only be a recognition of the absurdity of existence. Mounier believes that Kierkegaard's "freedom" consists in accepting *la condition humaine*, so that M. Sartre could say that "we are compelled to be free". But as man becomes free in this sense, so he becomes nothing; for there is nothing beyond experience.

17. M. Mounier seems to regard History as something purely external: a convenient method of classifying varieties within the species. For him History is the past.

18. M. Sartre describes Existentialism as a consistent atheism. In politics, he belongs to the Left, though he rejects the claims of Marxism as a system. Sartre regards Kierkegaard's Either-Or not as a dilemma, but as the Scylla and Charybdis of Existentialism. Theology and Abstraction are the dangers to be avoided by the philosophy of existence. Theology and God are abstractions, and Sartre would escape from such absolutes. The Existentialists refuse to understand tradition as anything but the dead body of Hlstory, fearing equally Theology and abstraction, and believing that they can find a way of life between these two. For Sartre History is more dead, if that can be, than for Mounier. Both equally repudiate tradition.

CHAPTER XXIX

THE PSYCHOANALYSTS

I. Freudian Psychoanalysis.

1. Psychiatry had its origin in medical practice. Since the time of Fransz Mesmer interest had been aroused in the abnormal, and mental treatment was tried in the field of medicine. Since it was so much concerned with the study of the mind, albeit abnormal, it soon attracted the attention of psychologists, who undertook the study at first on similar lines and then struck out on their own.

2. There were two dominant tendencies in the last century, materialistic and idealistic. The Materialist of course wanted to explain all psychic phenomena as material processes governed by the laws of matter; while the Idealist strove to demonstrate the power of mind over matter. The Materialists were in the ascendant. In the realm of Psychology we may call

the Materialists the "somatist" school, and the Idealists the "psychic" school.

3. We have already given an account of Hypnotism and of several schools of psychiatrists who made use of it in their clinics. Psycho-analysis must trace its origin to hypnotic psychiatry.

4. Sigmund Freud, born in 1856, studied medicine in the University of Vienna and worked for several years in physiological research. In 1881 he went in for medical practice. However, he continued to study the nervous system and the organic ailments that were manifest in mental aberrations. Hearing of Charcot, Freud went to Paris in 1885 and studied under him for about a year. In 1886 Freud returned to Vienna and started practice in psychiatry, treating especially cases of hysteria. Finding that many neurotic patients could not be hypnotized, contrary to Charcot's teaching, he made another trip to France, this time to see what he could learn from the rival school under Bernheim at Nancy. He returned to Vienna in a short time. Here he came into contact with Josef Breuer. Breuer had also been a physiologist who took to medical practice for a living. He was an older man than Freud by about fourteen years. Together they worked for a few years evolving a method of treatment of neurotic cases, which seemed to have phenomenal success. In 1896 Breuer dissociated himself from the new method; Freud carried on by himself, making a radical change in his method. He made extensive observations and wrote profusely, and by 1900 his method, which he called "psycho-analysis" became not only a technique for the treatment of the neuroses but a psychology with a large following. Freud's chief publications were *The Interpretation of Dreams* (1900), *The Psychopathology of Everyday Life* (1901), *Wit in Relation to the Unconscious* (1905), *Totem and Taboo* (1912), *The History of the Analytic Movement* (1917), *Beyond the Pleasure Principle* (1922), *The*

Problem of Lay Analyses (1927), *The Ego and the Id* (1927); besides innumerable essays and other monographs. He had a facile pen, and he expounded his theory and illustrations with such fascinating power, that his numerous works underwent several editions and were translated into many languages. By the year 1900 Freud had gathered round him a circle of followers, and in other countries also he gained adherents. In 1908 was held an International Congress of Psycho-analysts. Soon, however, the Psycho-analysts broke off into different camps. Freud's influence waned. He died in 1939 on the 24th of September, an exile from his country, at the ripe age of 84.

5. Freud's knowledge of anatomy and physiology and his keen interest in the nervous system and the brain, was an excellent preparation for his later work. When working under Charcot, who used hypnosis in the treatment of hysteria, he was probably disappointed in the claims of this method. However, one remark of Charcot was not forgotten by him. Charcot had casually observed to him that in practically all cases of neurosis, if one investigated deeply enough, there was sure to be discovered some trouble in the individual's sexual life. Yet Charcot himself did not go to the source and strike at the root of the matter. When Freud went to Nancy he learnt that the successes obtained there were chiefly among the poor, who were treated free. One incident here struck him and bore fruit later. Bernheim had told a patient under hypnosis to attack him after a certain time. It was a "post-hypnotic" suggestion, *i.e.*, a command suggested during hypnosis but to be executed after recovery. The patient duly carried out the order. When he was asked why he behaved in such a way, he said that he could not say; but when Bernheim persisted in saying that he ought to know, he suddenly blurted out with "But you yourself told me to do this a while ago."

6. Breuer had been working out a new method when Freud joined him. Breuer had discovered that after hypnotizing a certain woman, who was suffering from hysteria and having a plain talk with her on her emotional difficulties, she became better. The woman could recall under hypnosis events in her emotional life which she could not remember when not under the spell ; and having recalled them and spoken freely about them she felt much better for it, being relieved, as it were, from some sort of a tension ; moreover, her hysterical symptoms subsided. Breuer continued this "talking out" treatment on the patient till finally she was more or less her normal self. This experience of Breuer led him to make a method of it, and he and Freud put it into practice. They claimed success for the method of hypnosis combined with "talking out", and jointly published their results in 1893 and 1895.

7. Janet about the same time published some articles on hysteria showing how he had explored the patient's memory by hypnosis and laid bare the root-cause of the symptoms. Freud and Breuer however laid stress on talking-out as a method for eliminating the sources of disturbance. They called their method consequently 'mental catharsis'. They invented the term 'abreaction' to indicate the resolution of the pent-up emotion by talking-out. The violent inhibition or repression of certain events bringing about strong emotional disturbance like shame, was the source of trouble. Under hypnosis the events were revived and abreacted, *i.e.* allowed free expression, so that the emotion found, as it were, an outlet.

8. Breuer, however, had a disconcerting experience. One of his women patients at the end of protracted treatment fell violently in love with him. He felt that the new method was dangerous to the practitioner and that the psycho-analyst himself would find it impossible to keep up a scientific attitude. Breuer left Freud suddenly for no apparent reason.

After he left, Freud continued the clinic. He himself soon had a similar experience. He assumed, however, that it was a case of transference of affection on to himself as a substitute for the original object of love; and he conceived the notion of making use of this transference to effect the cure, himself maintaining a strictly impersonal attitude. He finally worked out a theory of transference and perfected the technique for employing it.

9. Presently Freud gave up hypnosis, but kept on with the talking-out. The Nancy incident suggested to him that even without hypnotism, the obstacle to memory could be overcome by insistent questioning. Thus psycho-analysis, as we know it today, was born. At first it was only a method. The technique was this: The patient was asked to lie down comfortably and relax. The analyst sat at the head of the patient out of the patient's sight. The patient was asked to dwell on his troubles and to say everything that he thought of, in short, to think aloud. This part of the technique was called by him "free association", although there was the limitation that the patient should confine himself only to his personal affairs and difficulties. There was to be no repression; whether trivial or embarrassing, every thought was to be revealed. Thus Freud's technique consisted of 'relaxation' and 'free-association'. Though slow, said Freud, the method was more successful and resulted in a more thorough catharsis. The patient was free from all such hindrances to his thought-processes and to their expression as arise from social conventions, religion, etc.

10. Freud then sought for some other way of detecting quickly the source of the trouble in the "unconscious". He soon found it in dreams, and invented the technique of dream-analysis. The patient relaxes as before and recounts the dream he has just had during the previous night. Then each item of the dream is allowed free association. The

analyst subjects every single item to a rigorous examination, looking for significations, interpreting symbols, until finally he is able to detect the 'complex from which the patient is suffering.

11. Freud found that some patients that had been dismissed as cured came back after a time with slightly different symptoms. He thought that in such cases he had not gone back far enough in the patient's life, and that if he did he would discover a further cause, whose overgrowth only he had cured in the first attempt, and whose presence in the subject's unconsciousness was likely to bring on trouble so long as it was not abreacted. Probing further back in his client's memories he discovered that the original complex was not in general an emotional shock received in early days, as he himself had believed after Breuer and Charcot found on investigation that what the patient had recalled was not an actual event of early childhood but a day-dream or phantasy that had taken hold of the child mind to such an extent as to have been invested with reality and firmly held as a fact. Such were recollections of incest and seduction in early childhood by members of the household. The phantasy, said Freud, had its origin in childish desire; the day-dream of later childhood was the outcome of an unfulfilled wish of earlier days. The analysis should, therefore, be pushed on back to the infancy of the client to discover what was at the core of the troubles in later life. Bearing in mind the incident at Nancy, Freud held that nothing ever experienced is ever absolutely forgotten, and that if the obstacles were sufficiently removed they would come back into consciousness. His attempts at dream-analysis failing to uncover the forgotten inhibited desire of early childhood, Freud thought that it would be sufficient if he merely revived the emotional attitude of early childhood; and that he could make the patient experience anew those early emotions by recalling even a few scrappy details of early life. This led to the development of his theory

of Transference and Sublimation. By free association the client, though not recalling events and objects or persons, would undergo the same early emotions. These would naturally find a present object, which might easily be the analyst. Thus the analyst could become the object of an exaggerated display of love or of fear or of distrust or of hate; and this would indicate the early attitude of the patient towards the parent. The patient would be left with a childlike dependence on the analyst. He has to be weaned from the transference, so that the analyst could finally make his exit from the emotional life of the patient and the latter could carry on normally by himself. Thus the patient was made emotionally his childhood self again, and then brought back to adult life on the right lines. The weaning is done by helping the patient to have a legitimate outlet for those childhood emotions in accordance with the present conditions of his adult life. It is called Sublimation.

12. Thus Freud, by persistence, overcame obstacle after another both in his technique as wel in theory, each set-back leading to something t was utilized finally to complete his scheme. In his theory Freud was much influenced by the dynamical psychology of Herbart. Of his contemporaries he was acquainted with the work of the English neurologist Hughlings Jackson and of the French psychologist Ribot, to both of whom he was indebted for some of his notions. He was also influenced by Nietzsche. Freud's study of neurotic led to a theory of neurotic symptoms and finally to a general psychology.

13. The practice of the psycho-analyst, Freud contends, requires an intensive training and supervision. He needs an equipment of several studies such as ethnology, the history of civilization, mythology, folklore, the psychology of religion, literature; and he should be firmly grounded in the psychology of the unconscious. An essential requirement in his training

is that he should analyse himself and be freed from his own repressed complexes; for only then can he maintain an impersonal attitude and treat another, avoiding a transference in the opposite direction, i.e., from himself to the patient.

14. The student of psycho-analysis is at first confused by the many technical terms he has to get up and the strangeness of the notions he has to imbibe. He comes across such terms as abreaction, transference, sublimation, talking-out, unconscious, sub-conscious, censor, incestuous-longing, inhibition, complex, oedipus-complex, castration-complex, archaic thinking, regression, fixation, etc. On arriving at a fuller understanding of psycho-analysis, however, he finds that the structure is quite simple. The whole theory can be grasped from a few basic principles and notions properly understood. The merit of Freud's system and the secret of its popularity is its simplicity, the harmony and close connection between theory and practice. Its early amazing popularity is due also to its insistence on sex, to the easy excuses it provides for indulgence, to the opportunity it gives for 'outlets', its amorality, and to its picturesqueness.

15. The aim of psycho-analysis is to discover the origin and growth of mental states, and to rectify abnormalities. From a consideration of the mental life of the individual it extended further to the life of the human race, the evolution of culture, of society, of religion.

16. We shall now make a list of the main tenets and notions of psycho-analysis, and only in connection with the individual. A few remarks of our own are put within parentheses.

17. Anything that has once been in consciousness is never absolutely forgotten.

18. To ascertain the causal connections and the true nature of different mental states one must go to the distant past of the individual.

19. The cause of amnesia or forgetfulness is the existence of obstacles in the mind causing resistance.

20. Mental states act on one another, so that the mind is an active dynamic system working according to dynamic laws, not unlike a physical system. (Herbart's speculation.)

21. The mind consists of different layers (like geological strata), the "conscious" at the top, the "unconscious" at the bottom, and different layers of the "subconscious" lie between. The unconscious is conceived as a sort of place where memories are stored which will not come up spontaneously nor can be made to return to consciousness. In the subconscious are contained memories not actually in consciousness but which are ready to be recalled at will or of their own activity or by following a connection of associations. (The idea of 'an unconscious mind' is not peculiar to psycho-analysis, nor did it originate with Freud. Freud, however, invested it with a structure of which the nature of instincts and the part they play in a mental dynamic system are characteristic.)

22. The barrier to consciousness is erected and maintained by a sort of 'force' at one time exerted, repressing or forcing into the unconscious and holding down some previous mental state. It is sometimes possible to break through the barrier by hypnosis or by insistent questioning.

23. Some memories are repressed, *i.e.* forced even below the subconscious and into the unconscious, because they are felt to be intolerable, as they are in opposition to certain dominating convictions or feelings or tendencies of consciousness. (It may be noted here

that 'repression' is an explanation, not a fact, as it has been claimed to be. This term implies a great deal of the theory of psycho-analysis.) The rich have more repressions than the poor, the civilized than the uncivilized. The reason of repression is a conflict between opposing forces. (Cf. Nietzsche's explanation of forgetting as the result of a conflict between memory and pride.)

24. The 'censor' is the power that renders impossible a spontaneous return to consciousness. It holds back a repressed memory against its tendency to rise up to a higher layer or any effort to bring it out of the unconscious by will or a linkage of free association. In short, the censor exerts resistance. This is manifested in the patient's behaviour, the unwillingness to go on with the free-association process, or the alleged inability to produce ideas. The resistance of the censor has to be overcome, before the repressed memory can escape from the unconscious and approach the 'threshold of consciousness'. (Herbart.) (We may note at this point that 'resistance' also is not a simple fact. It is either a metaphor, or it refers to the fact of some sort of 'effort' on the part of the analyst to 'overcome the barrier', *i.e.* to make the patient take up again the 'chain of associations', or to the report of the patient that he has 'to make an effort' or that he 'feels a kind of resistance'. The term, however, implies more than the mere fact; it implies an interpretation, and one of a dynamical nature.)

25. The origin of the forces are the primitive instincts which form an indelible part of the organization of man. The instincts are intensely egoistic, aiming only at pleasure. They belong to the physiological organization of man, and so are normal—of the body, not of the mind. They are peculiar arrangements of bodily functions and serve certain blind ends of their own. They are for ever out of the mind, inaccesible to direct mental influence.

26. In the child are uninhibited instinctual longings for the immediate realization of the instinctual ends. The realization gives the experience of pleasure or satisfaction. In earliest infancy this is the goal of any activity whatsoever of the child. Thus, earliest life is governed by 'The Principle of Pleasure'. Later on the pleasures of environment, of society, and of education and development, together with personal experiences of the actualities of life, have their influence in modifying this seeking for satisfaction. The child adjusts himself to reality and is less and less ruled by the Principle of Pleasure and more and more by 'The Principle of Reality'.

27. The adjustment to reality does not, however, change the basic attitude of the individual. For at bottom the two principles are identical. The aim is yet the greatest possible pleasure in the circumstances; it is only the mode of attaining it that is modified. The ways of satisfying the primitive instincts are now conditioned by actualities. The striving of the adult is of the same nature as that of the child; and the same is true of the human race.

28. The instincts remain the same, as the individual develops into an adult. The desires also remain the same; but they are, as it were, hidden by what appear to be new desires with new goals. These, however, owe their strength and pleasure only to the primitive instincts and instinctual longings, and have to be reckoned as modifications and detours of them. Every goal a man sets himself is a mask for a primitive instinct.

29. We are never conscious of our instincts as such, as we may be of reflexes; but we have in consciousness an idea or image of a situation promising immediate and full satisfaction to the instinctual craving. This idea or representation of an instinct acquires force by its association with an intense

longing for its realization for the sake of the anticipated pleasure. The instinctual representation is an original, crude, brutal idea of a situation as promising pleasure by the immediate complete satisfaction of the craving.

30. Freud's instincts are the bridge between matter and mind: they are of the body and their representations are of the mind; they are bodily functions and they are mental representations. As instincts they are of the body, non-mental; they are not even in the unconscious. What is repressed into the unconscious is an instinctual representation; what may be brought up into consciousness is the same disguised. An instinct has to find its outlet through the mind. The outlet is blocked up by the repression of the instinctual representation, but the process of sublimation (n. 41) solves the difficulty.

31. All behaviour, however passive it may appear to be, is an activity based on some instinctual mechanism. Objects are perceived in their relation to some instinctual desire.

32. The mind is made up of instincts or their representations and the modifications of them brought about by the influence of the factors mentioned in n. 10. The images corresponding to instinctual longings are the only primary content of the mind. All mental contents have some relation to the instincts, else they could never be in the mind.

33. The instincts may be divided into two great classes: those of the libido and those of the ego. Libido, for Freud, means sexuality. In addition to the libidinous instincts and the egoistic instincts, there is another, the instinct of death.

34. The instincts, belonging as they are to the very physiological organism, can never disappear,

nor can instinctual activities ever cease. It is only the instinctual representation (n.29) that disappears.

35. At first Freud held that an emotion demanded a discharge or expression, *i.e.* a normal outlet for its abreaction ; otherwise, like a foreign body embedded in living tissues, it would give rise to trouble. Later, Freud came to consider emotions as secondary to the instincts, being but the signs and effects of instinctual processes, and said that it is the instinct itself that demands discharge. An instinct operates when it is released by external circumstances or by internal changes. The discharge becomes necessary when the instinctual tension has reached a certain intensity. If the discharge when due is checked, the organism somehow resents it. By the discharge the tension is lowered and thus the satisfaction of the instinct is conditioned by it. Satisfaction of the instinct is subjectively the same as pleasure.

36. The discharge of the instinctual tension, its abreaction, is effected by indulgence in the instinctual desire.

37. A denial of satisfaction would result in gradually increasing tension, which would finally become intolerable. Satisfaction cannot be absolutely denied.

38. The satisfaction may be delayed, as, *e.g.* by the Principle of Reality. The delay is facilitated by an anticipated pleasure—*Vorlust*, pre-pleasure—which adds to the total pleasure of satisfaction.

39. The forces of environment are strong enough to raise obstacles that would make satisfaction impossible.

40. The dilemma raised by nn. 37 and 39 is the cause of many pathological disturbances; it is the source of neurosis.

41. The instinct turns to a new object when its representation n. 29 is brought back to consciousness. This is transference. In a special sense this means that the libido or sexual instinct sets up the analyst himself as its object, in the place of the infantile object, *e.g.* the parent, on which it had previously been fixed and from which it has just become detached. This transference cannot be avoided; indeed it is necessary for the liberation of the libidinous forces from their fixation.

42. When the transference is directed to a legitimate object, *i.e.*, to one in consonance with the laws of the environment, the process is called sublimation. (This term and the idea are found in Nietzsche.)

43. By sublimation the dilemma of n. 40 is solved.

44. The process of sublimation carried out according to the Principle of Reality brings about normal and healthy development of personality.

45. Non-instinctual goals of activity are 'used' by the instincts for their satisfaction. (Hegel's *List der Idee* may be compared to this notion of 'use'. Man, believing that he freely sets up his own ends and achieves them, really like everything else is only 'used' by the idea, and takes his place in the inevitable external march of the Absolute towards Being.)

46. That different goals set up in the mind are attractive in different degrees, is because they are endowed with different amounts of instinctual energy. Cf. n. 28.

47. The strength of attraction of objects—persons, things, ideas—of the external world, as ends, is given to them in the manner of a 'charge' by libido. Thus, every possible end other than of the ego is referred to a libidinous instinct.

48. The charge of libido carried by an object is called Cathexis.

49. The object substituted by sublimation is called the Symbol of the original one.

50. The censor (n. 24), like a janitor or 'keeper of the threshold', who is sometimes inattentive or sleepy, does not operate always with the same intensity. That is why it is possible to bring up repressed material back into consciousness.

51. But the censor never permits its prisoners to escape undisguised. They have to be disguised in symbols in order to escape recognition and slip through. In their nakedness they would at once come into conflict with the same forces that had cast them down, for they are now incompatible with the ideas, tendencies, and attitudes acquired later, and such incompatibles cannot be in the mind together.

52. Unconscious material escapes the censor's vigilance under disguise. In a normal person it is in slips of the tongue, in mistakes, in dreams; in a neurotic person it is in a symptom.

53. A dream is made up of symbols representing instinctual ends. The symbolization is veiled by the seemingly non-instinctual character.

54. Every dream is the fulfilment of some desire. This desire is not obviously manifest, because the objects and events of a dream are only symbols of what the instincts really demand; they are disguised images, escaped through the censor, unrecognized by the forces opposed to them.

55. The manifest content of a dream has to be analysed and the symbols interpreted in order to lay bare the latent content, which really has not come out of the unconscious.

56. Slips of the tongue or of the pen, misreading of words, mistakes, etc., are instances of the relaxation of the censor's vigilance, when some unconscious factor slips up into a conscious process.

57. The analysis of dreams and their interpretation—*Traumdentung*—are essential to psychoanalysis. They are sure means of investigating the unconscious.

58. The relations between the unconscious material brought up by free association and the facts of conscious life are discovered by the technique of interpretation. Behind the apparent absurdity and lack of coherence of a dream is hidden a definite meaning.

59. The only way of knowing when the association chain has reached the stage where there is no more symptom which could disappear or no immediate connection between the content of the dream and the symptoms, *i.e.*, the only way of knowing when all the relevant unconsciousness material has been brought into consciousness, is the assent of the patient or the consistency and plausibility of the interpretation. But the chain of associations can proceed indefinitely further, and by following it up the analyst delves deeper and deeper into the strata of the unconscious and further and further back into the life of the patient. Thus, one symbol may symbolize several unconscious factors lying one below the other.

60. A *psychic trauma* conditioning a symptom was first sought for in the near past; later, Freud sought for it in childhood. Later still, Freud logically went further and spoke of the *trauma of birth*, the first shock experienced by the human organism as it leaves the mother's womb. The Freudians went further still and spoke of *pre-natal traumas*.

61. Freud developed a meta-psychology, by which he meant a merely speculative theory above or beyond verifiable facts. It referred to three points of view of mental phenomena: the dynamic view-point, according as they are caused by and express instinctual forces; the topological view-point, according as they are considered as belonging to different mental strata; and the economic view-point, according to their shares in the distribution of mental energy. The economic view-point merely recognizes the facts that the mind may attend to several objects, that concentration on one thing takes away from attention to another, and that interest may shift from object to object and vary with respect to them and even to the same object. [The figurative language with its spatial schemata are a pit which psycho-analysts dig for themselves to fall into.]

62. Topologically, man's nature consists of three layers: the *Id*, the *Ego* and the *Super-ego*. The Id is essentially unconscious, pre-formed, and containing the unchanging instincts. It alone exists at first. Built upon it, as it were, is the Ego, which develops by the activity of the pre-formed ego-instincts. It is to some extent antagonistic to the Id. The Super-ego contains ideals, abstract ideas, moral notions, social conventions, etc., by which the life of the adult is directed. It is the latest to develop, and its rise and development are based on the activity of the pre-formed ego-instincts. (Thus though man is distinguished from animals by the Super-ego, the distinction is one only of degree.)

63. The Super-ego has no instincts of its own. It arises by the process of identification, by which is meant imagining oneself in the place of another whom one admires or is envious of. Thus the adoption of ideals, convictions, etc., would be the effect of causes that have their origins in the instinctual organization, and man's mind and personality arise ultimately from the Id. (The notions of the Id, the Ego and the Super-ego recall to mind Plato's trichotomy of man).

64. By the concept of ambivalence of instincts, Freud overcame several inconsistencies. Ambivalence signifies the equivalence of opposite ways of behaviour inasmuch as they spring from the same instinct. Libido is both an attraction and a repulsion. The desire to possess and the desire to destroy, love and hate, have opposite aspects, but arise from one and the same instinctual source. An instinct can make an about-turn. Thus, any one instinct can come into opposition with every other, and this would account for the possibilities of conflict. (We ourselves have thought of a comparison : an automobile may change its direction and may even go backwards, though the source of energy is the same. Poets and others have observed that there is only a thin partition between love and hate.)

65. We have, in the above, given in a very condensed form the main tenets and notions of Freud's psycho-analysis. We shall in the next section proceed to a critique of the system.

II. A Critique of Freudian Psycho-analysis.

66. A subject of study, especially in its younger days, is very liable to be caught in the dangers of verbalism. New words and new ways of expression have to be found to express new ideas. These ideas are constantly changing. If words and expressions already in common use be taken over as being the most expressive, *i.e.* nearest in meaning to what is required, there is the additional danger of misleading the uninitiated. Further, when they are such as to bring up pictures to the mind, then there is the pitfall of building up parables, as Jeans said, and being misled by them. Francis Bacon, Lord Verulam, issued a warning centuries ago against the dangers of the *idola fori*. Mr. C. K. Ogden recently pointed out 'fictions' arising from the extension of the meaning of words.

67. Even in common talk these dangers arise. And there are dangers even in the use of simple words. I know a lecturer in Logic who misunderstood the use of the word 'of' in a definition and consequently could not understand the examples cited. In the physical sciences many of the words taken from common speech have crystallized out and become technical by acquiring definite meanings.

68. Philosophy, however, has frequently fallen into such pitfalls. Bergson pointed out the difficulties of Psychology in the choice and use of words. Psychology is specially liable to err, not only because it is still a young science but also because there is no psychological concept that is not somehow akin to concepts of long ago and to those of common speech; and, more, because, just as mathematics and the physical sciences have their symbols or nominal definitions and formulae to work upon, not to speak of actual apparatus and sense-observations, psychology requires pictures or allegories or parables in which to express its findings.

69. Many of the sterile disputes in Philosophy arise from the varying use of words, *e.g.* idea, substance, cause, association. The word 'cause' has several meanings, (See *Science, Cause and God* by the author). If we should use this word or any of its derivatives in a strictly philosophical essay, it would be advisable to indicate always the sense in which it is taken. The words 'because' and 'therefore' refer generally to a reason, which is either a Formal or a Final Cause, in the logical or semantic or psychological sense. Thus we write: "I took it, because (F,P) I wanted it". "Because (f,L) the two sides of the triangle are equal, etc." "The figure has only three sides because (F,L,S) it is a triangle" etc. F indicates Final Cause, f Formal Cause, P Psychological Cause, L Logical Cause, S Semantic Cause.

70. It must be noted that a Psychological Cause, or reason for the existence of a mental state and of such a state, is never an Efficient Cause. (Cause E). It can be a mental habit by association or signification or symbolism, or a need, or a desire. A cause and a condition are also often confused. The word 'cause', however, generally brings up the concept of Efficient Cause.

71. The word 'determine' and its derivatives also have several meanings as may be seen in a good dictionary. It refers variously to a relation which may be logical, or semantic, (*i.e.* pertaining to meaning, sense, or signification), or symbolic, or psychological (associative, as in a mental habit, or moral, as in willing), or efficiently causal.

72. In the same context to take such words in different senses is to open the door for deception or self-deception.

73. Again, the use of words bringing up spatio-temporal pictures, involves the danger of making conclusions from them by carrying analogies beyond the point originally noted.

74. Psycho-analysis has fallen very heavily into these pitfalls.

75. Psycho-analysis often takes for granted what it claims to prove. It presents theories as if they were facts. It offers its factual conclusions so much dressed up in its theory that it is hardly distinguishable from it. It reads its facts only in the language of its theory.

76. Thus the terms 'resistance' and 'effort' are taken to represent facts. They certainly imply and are used by psycho-analysts to imply a concept of 'force'—more indeed than the mere fact actually

observed, which is the interruption in the chain of free association or the difficulty experienced in continuing it, or on the other hand the trouble taken by the analyst to get the patient to go on.

77. Again, the psycho-analyst speaks of a causal connection between the conscious mental fact, (such as an item of a dream, a slip of the tongue, etc.), and the 'unconscious' material brought up by the process of free association. The relation, however, can only be one of symbolism or signification or at the most of contiguity. But the term 'causal' is used in a physical sense. He adduces as a proof the disappearance of abnormal symptoms once the unconscious material is brought up into consciousness. This proof is lacking altogether in the case of normal persons and no abnormal symptom to deal with. The extension of a theory fitting in with results obtained in the treatment of neurotic patients to normal mental phenomena, is not based on facts but on the confusion between relations of signification and those of efficient causation. The psycho-analyst believes that he unearths causal connections, because he sets out with the idea that these are the only relations he will find. The confusion is facilitated by the indiscriminate use of the words 'cause' and 'determine', to which we have referred above. Freud's interpretation of 'resistance' was in accordance with the ideas on human nature and the functioning of the mind, current about the end of the last century.

78. The criterion of Therapy is the disappearance of abnormal symptoms. This criterion is lacking when there are no such symptoms, as in a normal person. In the case of neurotics the analyst accepts the assent of the patient. This assent is very seldom given, nor has it any value when the analysis is pursued into the dim regions of infancy and even further back. The analyst's criterion then can only be the satisfactoriness and consistency of his interpretation

This interpretation is in accordance with a scheme implying an accepted doctrine regarding the structure and working of the mind. All the 'facts' therefore that the analyst adduces to prove his theory on the meaning of dreams, are selected and presented precisely on the basis of that theory.

79. The psycho-analysts never defend their position. All they have to say is either that one who has himself not been analysed and who does not follow their system can never understand it, or that their adversaries are themselves suffering from certain complexes—quite a novel way of establishing a science!

80. Nor can the harmony between practice and theory alone justify psycho-analysis; for one is involved in the other. There is a vicious circle, which will not disappear unless the 'facts' of psycho-analysis are confirmed by totally different methods. But such 'facts' can only be observed by psycho-analysts alone, for they are always tinged with the theory; they presuppose what has to be proved. The attempts to 'confirm' its findings by reference to data said to be provided by ethnology, and the comparative study of religion, rites, customs, society, suffer from the same defects in precisely the same way.

81. Psycho-analysis has certainly alighted on some truths, but they lie profoundly hidden in a mass of unacceptable statements.

82. What we have said above is sufficient to condemn psycho-analysis as a psychology or as a science. But it is interesting to go further and investigate its basic assumptions and underlying philosophy.

83. The basic assumptions of psycho-analysis disclose the underlying philosophy. They themselves are not based on facts, but all statements of its 'facts' are in its terminology.

84. Psycho-analysis holds as a fundamental tenet that both in nature as well as in mode of development mental processes are analagous and parallel to nervous processes, or rather that the functional units of mental processes are the reflexes themselves from-which complex phenomena are built up both in physiological life as well as in mental life. This atomistic idea was current in the nineties and Freud was educated in it. It is indispensible to his system.

85. Freud, however, invested the reflex organization as understood at that time with certain special features. The reflexes were interdependent, and formed a complicated system covering not only present actual conditions but also every moment of the past, not only of the individual but of the whole human race. Every mental fact had not only its own or absolute value in itself but also a positional or relative value in respect to its present conditions and to its antecedents. When Freud said that the instincts undergoing changes had a *Triebschicksal* ('fate'). he meant that they were determined by a totality of influences, pertaining not only to present circumstances but to the whole of the past, that moulded the human personality. Freud also endowed mental processes with a sort of perpetuity. The mental processes, ultimately the physiological ones, leave traces behind that can never be obliterated; and thus they remain stored up, as it were, yet able to exert an influence again, no matter how long they have been seemingly inactive.

86. Thus Freud went with the current of thought fashionable at the end of the last century: he accepted the atomistic or elementaristic view: the custom of explaining mental processes in the language of physiology; the doctrine of reflexes as then understood, that the mental mechanism, is the reflex mechanism, and that mental facts are but manifestations of brain processes; the doctrine of the 'localization' of mental

processes in brain 'centres', that of material traces being left in localized cells of the cerebral cortex. The slight modifications, or rather additions, that he made to current theory, were for the sake of obtaining a more comprehensive view of the human mind.

87. It is now known that reflexes are not the absolutely rigid mechanisms they were thought to be. The notion of particular mental processes going on in particular areas of the brain, and of memory images being accordingly allocated to different regions, *e.g.* that visual memory images are stored up in one area, has already been given up for some time. If a psychological analysis be made of the factors influencing the form of a complex mental process, it may be pointed out that a certain factor has been affected by a certain pathological process: but that the disturbance has taken place in a particular brain-centre, is certainly untrue.

88. If the Freudian pattern of the reflex mechanism be revised today, the whole system of psychoanalysis would collapse, for it is a link connecting together all its other basic concepts.

89. Another of Freud's assumptions—it has to be considered as such—is that mental processes are governed by laws such as obtain in Physics. This notion is the same as that of Herbart; the only difference is that whereas Herbart had in mind only gravitational forces and mechanical energy, Freud was taken up with electrical forces, 'charges', and energy. The energy of a mental process was of the same nature. Every mental process was a modification of energy-distribution. Every mental fact—emotion, image, idea, desire, etc.—had a definite 'charge' of mental energy (cathexis). Freud looked upon the 'tension' in a reflex as a sort of 'potential difference', and upon the reflex-action as a 'discharge' by which the tension was eased and equilibrium restored. For

Freud, moreover, mental energy and the energy of physiological changes were the same thing. Conversion is the term used by him for the transformation of one into the other. A tension arises with an accumulation of a charge. The stored-up potential energy has to be transformed into kinetic energy, and this takes place in the natural expression of an emotion. (At first Freud's tension had reference only to emotion, but later he connected it with every other mental fact.) If kept pent up, (insulated, as it were), the tension remains, and eventually brings about abnormal symptoms. Even the word 'repression' suggests, and is meant to suggest, the use of force to push down into oblivion (the 'unconscious') a mental element and to hold it down there. In fact, every term used in psycho-analysis is suggestive of its theories, and brings up a picture in the mind.

90. The most cogent argument against Freud's doctrine is that it is but an analogy, a vivid picture easily understood—and therefore the more misleading —and that the analogy as far as it is extended is not at all based on facts. This objection alone is more than sufficient. But there are also insurmountable difficulties arising from the theory.

91. The Freudians speak of one emotion, one idea, one image, etc., taking the notion of unity from common acceptance. They do not attempt to define when a mental process is to be considered as a unit and when as made up of units. This is a demand of any scientific study. The names of the 'elements' of mental life are also taken from language, as if that which has one name were one element bearing an energy-charge of its own.

92. No explanation is forthcoming as to how the mental charges in an individual keep apart in separate units or groups, just as electrical charges can in certain circumstances. Even if physical energy involved

in a physiological process be measured, by what criterion can a definite amount of it be taken as the 'conversion' of energy in a particular mental process?

93. Freud accepted the Association Theory and attempted to explain association by cathexis, discharge, energy-interaction; but this was just as much an attempt to support his own speculation by the facts of association. That theory itself finds little favour with psychologists of the present day.

94. The ideas of mental energy, of mental effort, of mental tension, of mental conflict, are far from being new. The popular notions have not been sufficiently refined and defined by psycho-analysis to merit the rank of scientific concepts.

95. Determinism was the fashion in XIX century philosophy; Freud was a strict determinist, and his system was wholly in conformity with the doctrine of Determinism. It is therefore subject to all the objections raised against Determinism.

96. Finally, we must say that psycho-analysis comes under all the objections that may be raised against Solipsism, against Materialism, against Atomism, against Materialistic Evolutionarism, against Materialistic Monism and against Hedonism.

97. We have just said that psycho-analysis has to meet all the objections raised against Determinism. For one of its basic assumptions is that all mental processes or 'events' are strictly determined, and that their connections and interactions are in the manner of cause-effects. Nothing is forgotten; what is not remembered has only been 'repressed' into the unconscious, and must have an effect sooner or later. For Freud, causality in the mental world was absolutely of the same kind as in the material world. He had no place for Free Will.

98. It is superfluous to bring up all the arguments for and against Determinism in the physical sciences, and to recall the heated controversy that raged about causality. They are elaborated in the works of Eddington, Jeans, Levy, Crowther and others. (See *Science, Cause and God* Ch. X). Nor is it to the point; for, although psycho-analysis is patterned after Physics, its 'causes' are certainly not of the same type as physical 'causes'—even if the term be understood in the XIX century manner, before anybody thought of expunging it from the scientific dictionary. The relation of signification or analogy is certainly not the same as one of efficient causality. Again, the notion of causality in Physics is closely connected with quantity and its measurement. But there are mental phenomena that cannot be subjected to measurement—to mention only one *e.g.* judgment. Moreover, such mental phenomena as seem to have the quality of intensity, cannot be directly measured. What is measured in these cases is something isolated from its essentially mental aspect. We may find in the physical world analogies to or pictures of mental processes and relations, but this does not justify us in identifying the one with the other. Honest philosophers recognize that the gap between Biology and the physical sciences has not yet been bridged, and many doubt whether it will ever be done. There is a wider gap between Psychology and the physical sciences, which will persist at least as long as the other gap persists.

99. Only by considering mental processes as fundamentally identical with reflex action, was Freud able to allot to the instincts their peculiar role. The instincts are at the foundation of every mental phenomenon. This is another of Freud's basic assumptions.

100. At one time, under the influence of Empiricism, all mental phenomena were held to be complexes of 'sensations'. This notion proved unsatisfactory;

but still the search went on for irreducible 'elements', or elementary mental facts to which all others could ultimately be reduced. Reflexes also did not come up to scratch. For a consistent materialistic monism there should be no irreducible elements, but all should be reduced in the last analysis to a single one. Freud hit upon instinct as the primal material of which every mental phenomenon consists. He tried to reduce the number of instincts to one, but could not.

101. Freud used the German *Trieb*, of which 'urge' and 'instinct' may equally be the English rendering. He himself may be held to have sanctioned the rendering 'instinct' by its use in articles written by him in English.

102. In order to show how the representations themselves of instincts came to be in the mind, and not to violate the principle that every mental object has its origin in sensation, Freud had to invent a selective power for the instincts. The mind reacted only to those objects of the external world which were by themselves related to the primitive instinctual desires. The mind therefore selected from the external manifold only what was directly or in some way capable of satisfying the instincts. Thus the instincts conditioned subjectively the contents of the mind. Psychoanalysis therefore asserts that every mental state or every object referring to a mental state is basically the object of an instinct, destined to satisfy its cravings. Behaviour is a manifestation of the primitive instincts; every object of thought a 'symbol' of a crude instinctual aim. Freud divided the instincts into two main classes: the egoistical and the libidinous. The one instinct urging for closer union with an object is libido. All instincts directed towards objects are essentially sexual.

103. This raises up a serious difficulty. Psychoanalysis logically leads to Berkeleian Subjectivism, or

Solipsism, for if by sublimation an object, in no way sexual in itself, be set up as a legitimate object really capable of satisfying libidinous desires, then it is not merely invested with an appearance by the subject but is also in reality fundamentally related to libido. Thus every possible aim of action and striving is sexual. Appearances are deceitful; there is no reality, but only a seeming.

104. Freud's notion of 'conflict' is strange when referred to instincts. The ego instincts are opposed to the libidinous ones; the death instinct is opposed to the other two instincts; the libidinous instincts may themselves take up opposite tendencies. If Freud were consistent, he would speak of the 'resultant' of instincts, just as we conceive of a resultant of forces, rather than of 'conflict' between 'instincts'. The use of the term 'conflict' suggests that a conflict between two persons is due only to instinctual antagonism and that social equilibrium is of a dynamical nature. The term enables the psycho-analyst to sit on the fence between psychology and physiology.

105. Freud accepted the Doctrine of Evolution propagated and popularized by Darwin and Huxley in England and by Haeckel in Germany. If he were not acquainted with it, he would have been behind the times; if he did not incorporate it into his scheme, he would have had no hearing.

106. Haeckel's 'law' of ontogenesis stated that the development of the individual was a concise recapitulation of the evolution of the race. Thus embryological development is a brief epitome of the history of a young creature climbing its ancestral tree from a fishlike form through various stages up to its full development as a human being.

107. The facts themselves adduced in evidence for the 'law' are only a superficial similarity between

the foetus in different stages of growth and the present day 'lower' forms of life. The 'law' itself is merely a doctrine not derived by a comparison of undubitable facts.

108. Freud seized upon the idea and extended it to mental evolution: the mental development of the individual is a recapitulation of the mental history of man. The human embryo has an animal life; the new-born child starting on the level of the animal progresses through stages of the mentality of prehistoric man and the savage, to attain with maturity the full mental development of modern civilized man. Freud believed that by putting the genetic point of view in the foreground he had made psycho-analysis 'scientific'.

109. One point must be noted at once. Psycho-analysis is placed on a par with phylogenesis; and this in spite of a great difference: in man's phyletic history there are substantial changes, new features are added, new generic and specific forms; whereas in his psychic history there are only accidental changes within the one species. That psychic changes result from being caused by material changes, is therefore an assumption on which psycho-analysis rests. That Freud's 'law of psychogenesis' has been confirmed by the study of ethnology and of cultural history is an untenable claim. The similarity in behaviour of the infant and the savage or primitive man as he is supposed to have been, is held to justify the assertion that the unconscious operates in the manner of the 'archaic' mind, *i.e.* such as is supposed to have been active in primitive man. Freud's extension of Haeckel's 'law' to the psychic sphere is certainly not based on facts.

110. Freud assumed that by going back along the chain of free associations the analyst arrives at the real cause of mental phenomena. We have already

observed that in this connection the term 'cause' can at most mean a sign or symbol. Apart from this, there is no objective basis for the assumption. The disappearance of the symptom (when there was one to start with), the assent of the patient, the satisfactoriness of the interpretation—such are the facts brought up to support the statement. It is superfluous to examine the objectivity of such facts; they will not stand the test.

111. Freud uses the term 'cause' excusably perhaps when he refers merely to an associative relation, a connection of contiguity or of symbolism (which is also one of contiguity). But as he is in search of efficient cause, to say that the thing symbolized is the cause is indeed a juggling with words. It may more justifiably be said that the 'cause' is the general tendency of the human mind to express itself. The thing itself that is expressed is not the efficient cause of the expression, the thing symbolized not the cause of the symbol. The tendency discovered is a psychological (formal or final) cause. The statement of a general tendency is a 'law', which is a logical (formal) cause. The psycho-analysts (who deal so much with symbols) identify meaning or symbolism with causation only in regard to the repressed material of the unconscious in its relation to the symptom or dream-item or slip of the tongue, for they have to make their mental dynamics complete.

112. Psycho-analysis is both a therapeutic technique as well as a theory of human nature, and the former is merely the expression of the latter in practice. We should be inconsistent if we accepted the method while rejecting the theory.

113. This is not the place to expose the philosophical basis of psycho-analysis. Nor is it necessary. If we should show that psycho-analysis is extremely subjectivist, the psycho-analyst either would not worry

to disprove the point or he would deny having anything to do with philosophy (though such a denial is itself a philosophical attitude). We hold, however, that psycho-analysis is based on false philosophy, and is therefore unacceptable. The claim of psycho-analysis to be a 'science' is very unlike that of the present day objectivist psychologies; it is based solely on its connections with elementarism, its analogies from electrodynamics, and with the speculations of Biology of the end of the XIX century, and its alignment with evolutionary interpretations of ethnology and comparative studies of mythology and culture. It ignores several obvious aspects of mental facts, *e.g.* free-will, responsibility, personality. It rejects goals of action other than pleasure. It has no conception of value other than a hedonistic subjectivistic one. It is incompatible with morality. Its emphasis on sexuality is dangerous, to say the least. A false theory may lead by research to its own rejection; it contains some truth, but it has its Achilles' heel. Psycho-analysis, however, renders even this impossible, so that no theory is better than this one.

114. Freud had the mind of a genius; but this made matters worse. His useful work must, however, be assessed at their full value. He gave a tremendous impetus to the study of neurosis, and he inaugurated psycho-pathology. He justly emphasized the enormous importance of the child's experiences in connection with its later development. He drew attention to non-intellectual factors in the growth of personality. Indirectly and unwittingly he paved the way for a better understanding of the dignity of the mind and for an acknowledgment of the dominating position held by the soul in human nature.

CHAPTER XXX

THE PSYCHOANALYSTS—(Cont.)

III. Analytical Psychology

1. Having considered Freud's system at such length, it is not necessary to go into detail in regard to the offshoots of his school. Although the term "psycho-analysis" properly belongs to Freud's system and has been justly claimed by Freud as exclusively his, yet two at least of the offshoots, like these of Jung and Stekel may retain the title inasmuch as they accept the bulk of Freudian ideas.

2. C. G. Jung of Zurich (b. 1875) was taken up by psycho-analysis. He studied and practised it even before he came into personal contact with Freud. For a few years they worked together, Jung being full of ideas and very prolific in his writings. Freud. desiring to keep in the background, got him made president of the international association of psycho-analysis. Jung's lengthy book on *Changes and Forms of Libido* was published in Freud's periodicals. Soon, however, Jung came to regard Freud's conceptions as one-sided and not properly developed, and expounded in a series of articles a more advanced complex doctrine which he called 'Analytical Psychology'. A secession was the result.

3. Jung's modifications were in regard to neurosis and libido and the unconscious.

4. Freud had traced the origin of neurosis in the adult to the Oedipus-complex of the child. To Jung, this is only a 'predisposing cause', not the 'exciting cause'. The inefficient adaptations of childhood give rise to bad complexes, but the individual does not necessarily lapse into neurosis. The exciting cause is a difficult situation, requiring of the adult a new

adaptation. For want of sufficient strength he regresses into childhood habits of meeting such a situation. Thus he may take refuge in phantasy and resort to an imaginary solution. If perchance the present difficulty solves itself, his infantile behaviour quickly vanishes; if not, his regression takes him away from realities and far from a real solution. Hence the exciting cause of the neurosis is the present actual difficulty of adjustment—perhaps a necessary task that the patient will not accomplish. The unearthing of past causes, though useful in itself, is insufficient for the cure of neurosis. A transformation of energies and a new synthesis is necessary. Thus, though Jung adheres to the technique of free-association and dream-analysis, he starts with an investigation of the patient's present difficulty and the elements of weakness manifested in his way of meeting it. He takes the patient's dreams to reveal not only his past repressed sex desires but also his unconscious attitude towards the present difficulty. The patient, made aware by analysis of his infantile past as well as of his present childish attitude, is rendered capable of integrating the unconscious with the conscious and making up a stronger personality. Freud objected to Jung's work, as he saw a 'moralizing tendency' in it.

5. Jung gave libido a wider meaning than Freud. He denied that it was distinctively sexual. It had to include Freud's libido as well as Adler's "will to power." Libido, he said, was a general urge, akin to Schopenhauer's will-to-live or to Bergson's *elan vital*. He conceived of it as a general vital energy whose goal was growth, development, reproduction, activity. Its outlet in the infant was in the nutritive activities, with the corresponding pleasure arising from the libido. The pleasure of nutrition is not, however, to be considered as sexual, since the sex urge has not yet differentiated itself from the general vital urge. Freud, says Jung, is one-sided in his emphasis on sexuality. Jung took his cue from the concept of energy as given in

Physics, and of the conversion and conservation of energies. There is one general psychical energy or libido that manifests itself in different forms, *e.g.* in the will-to-power, and in sex desire. If the energy of one activity be directed into another channel, it is transformed, though it may retain some meagre traces of its source.

6. In 1911 Jung published a treatise on ***Changes and Forms of Libido.*** This work which had the full approval of Freud, implied the complete theory that Freud later on evolved. In it we are told that adult behaviour is determined by the libidinous behaviour of earliest childhood, so that as all reactions to objects depend on libido, the influences on sexuality and the libidinous behaviour of childhood depending on them form the pattern according to which adult behaviour is shaped. Later Jung developed views which Freud would not accept, and the pupil seceded from the master to form a psycho-analytic school of his own.

7. C. G. Jung's notion of the libido as a general undifferentiated attitude in regard to objects, and of sexuality as a specialization or differentiation of it, was not accepted by Freud.

8. Moreover, Jung conceived of energy as tending toward an equilibrium. A neurosis is a maladjustment of energies.

9. Freud, Adler, and Jung, each had his own code of interpretation of dreams, and this led to very divergent meanings given to any one dream. However, their aim was rather to discover some complex or longing or attitude to life than to assign a special mystical significance to a particular dream.

10. Jung set out to reconcile Freud's and Adler's systems. Freud's repressed sex desires and Adler's will-to-power represented apparently unidentifiable

motives for both dreams as well as neurosis. Jung found a way and invented his psychological types. One is the type of individual motivated by the will-to-power, with his attention directed to the self, his interests centred on the self; another is that of the individual who is moved by sex, with his attention turned to the object of love, his interests directed to it. The former type is the introvert, dominated by thought, pensive, reticent, retired, inclined to day dreaming; the latter is the extravert, dominated by feeling, sociable, light-hearted, communicative. Jung said that in both was the same fundamental life-energy, libido, manifesting itself in the extravert in one way—*ad extra*, towards objects—and in the introvert in another way—***ad intra***, towards the self.

11. It was found impossible to classify human beings into these two cut-and-dried types. Individuals are distributed about a mean in such a way that the density of distribution is greatest nearest that mean and diminishes gradually and more or less rapidly as we go away from it. Jung, therefore, invented a new type, the ambivert, whose libido was directed both inwards and outwards so that his interests were neither predominantly in the self nor predominantly in the object.

12. Psychologists who have taken up Jung's notion of types have made up a scale of measurement of introversion-extraversion extending from one extreme to the other. They count up as many symptoms of either character as possible that the individual manifests or acknowledges as befitting him, *e.g.* in the answers to a set of questions, and they work out from the results the individual's position on the scale.

13. Later on Jung added four other types, a sensing type, a thinking type, a feeling type, an intuitive type. He observed also that an individual may be

an introvert in his conscious life and an extravert in his unconscious life, or vice-versa.

14. Jung went further than Freud in his notion of the unconscious. He distinguished between the personal unconscious and the collective or racial unconscious. As for Freud, the personal unconscious is the outcome of repression from the individual's conscious experience; but Jung included in it also forgotten material, or experience and knowledge dissociated from consciousness, as well as material unconsciously acquired.

15. The collective or racial unconscious is the outcome similarly of the knowledge and experience of the race in its life-history. It is inherited, the individual getting it by way of the growth and development of his organism; in which he reproduces the history of the race. The individual is disposed to think and act in a manner determined by the habitual ways of thinking and acting of countless generations of his predecessors from remotest antiquity. The racial unconscious shows itself in "instincts", which are primitive ways of acting, and "primordial ideas" or "archetypes", which are primitive ways of thinking; though, strictly speaking, there is no rigid distinction, for these two go together.

16. The racial unconscious is manifest in dreams and neuroses and in the hallucinations and delusions of the insane as strange ways of thinking and acting such as can only be ascribed to primitive beings. It is not the ideas themselves that are inherited but the tendencies to slip into them. In abnormal moments, or when taken unawares and suddenly by something tremendous, even a normal person is apt to think of spirits, powers, devils. Primitive facts are impressed on collective thought and recur as symbols in our thought and speech. Such are parents, sex, growth, decay, reproduction. The individual, once he is

aware of some of his primordial ideas and instincts can integrate them into his conscious life and give out a new personality.

17. The understanding of the collective unconscious is greatly benefited by the study of mythology and of primitive customs. Jung divides the "psyche" into compartments, as it were: the ***persona*** and the ***anima*** (or ***animus***); the conscious, the personal unconscious, and the collective unconscious; the Ego, the Individual and the Shadow. He throws into the collective unconscious all those tendencies and strivings and associations inherited from the thousands of generations in the evolution of the race. For one thing, if no anterior event in the life of the individual can be traced to explain a neurotic state, the blame can be thrown on the collective unconscious; for another, his divisions are too rigidly drawn. The equilibrium (or disequilibrium) of these parts under the principle of one half (superior) compensating for or balancing the other half (inferior), explains for Dr. Jung all cases of neurosis.

18. Jung himself makes varied statements, from which it is very difficult to understand what he exactly means. He asserts that in the first two or three years of life, the child is unconscious of itself and can be compared to the animal state; it develops out of the unconscious and animal-like condition to consciousness, and only when it begins to say 'I' does it arrive at a perceptible continuity of consciousness. Few will accept this statement. In it Jung certainly does not speak of the unconscious in the same sense as he does elsewhere, or of the conscious according to common usage.

19. Freud's ethnological principle, which had been clearly stated by Jung himself, and which Freud so vigorously applied to Sociology and to History, was this: the very same laws that govern individual

nature governed also the evolution of mankind throughout the ages. Freud really applied his supposed discoveries to the history of the past, taking this in such a way as to illustrate and support his findings; the proper way should have been the reverse. Jung developed from this principle his notion of a "collective unconscious", while Freud spoke of a "group-mind". Both the notions are beset with the same difficulties. No answer is given by psycho-analysts to questions like these: Has the group-mind an organism in which it resides or of which it is a manifestation? If so, which is it? How does it function? What happens to it when the group is dissolved? Are the functions and content of the group-mind common to all the members of the group; or is it merely the sum-total of all the individual minds, so that the term could only be an analogy? The contents can only be those facts that pertain to the group; the functions only those activities that are effective in the group. It is fairly evident, however, that the mental level of a group is far below that of the individual. Moreover, if the group-mind can only know the most commonplace, the most primitive, and is ruled by emotions and instincts, it is difficult for the psycho-analyst to point out whence "repression" arises. Few sociologists accept the Freudian principle.

20. Both Freud and Jung were influenced by Schopenhauer's doctrines. They had been Herbartian to a great extent, transforming Herbart's dynamic interplay of ideas into one of instincts. In the same way, Schopenhauer's notion of Will as the essence of reality, unconscious in nature but conscious in man, a sort of impersonal supra-individual cosmic power, was suggestive of the group-mind and of the collective-unconscious, especially as the popularity of Haeckel's doctrine of the infant reproducing the life of the race had to be incorporated into a scheme striving for popular acceptance.

21. Schopenhauer, Nietzsche and Weininger considered "male" and "female" as opposite positive natures in a kind of purely logical opposition. They committed the blunder so much decried by physical scientists of considering "properties" as characteristics, or entological principles wrapped up, as it were, indissolubly with an object and carried about by it in all circumstances. Scientists consider only manifestations of behaviour and not inherent properties like the so-called "Newtonian Force". Hence in modern science the word "property" is taken as "mode of behaviour". It is strange, however, that in Psychology such mental fictions should continue, after attention has been drawn to them with so much emphasis.

22. Weininger climbed down by saying that a man as not wholly male and a woman not wholly female. (It would seem, however, that a person is a composite of male and female "properties" in the sense discarded by science.) Freud accepted the distinction, but held that the sexes were mutually complementary and such that "opposite poles attract each other". His great guiding principle of human behaviour was the sex-urge. Dr. Jung of Zurich accepted the same antithesis of opposites; Yes and No he considered to be inherent in our mental structure such that "if the affirmative be exaggerated, the negative at once rises up to contradict it". Thus he explains mental conflict. (However, even he is forced to put the Yes and the No in different units, e.g. one in feeling and the other in reason.) Dr. Jung takes the word Libido in a wider sense than Freud. He conceives of it as dynamic energy emanating from the "Collective Unconscious"—that unconscious part of the psyche acquired in the life of the race, as distinct from the "Personal Unconscious", which is acquired in the life of the individual. Its expressions are instinct, desire and function; and their transformations and variations are not the mere increase

and decrease of the libido but are actual changes of its direction. Thus libido is two-fold, both positive but oppositely directed. Further, the libido is "the creative principle of life, animating all conscious purposes". With these principles, Jung explains "animus" and "anima", "introvert" and "extravert". It is not necessary to go further into his fictions, but we may put his explanations with his four "function-types", thinking, feeling, intuition, and sensation, on a par with explanations by certain ancient Greeks of bodies by their constituent four 'elements'.

CHAPTER XXXI

THE PSYCHOANALYSTS—(Cont.)

IV. Individual Psychology

1. Freud had gathered a large and influential group of enthusiasts about him in the first decade of this century. But about the year 1912, several of the bolder spirits broke away and sub-schools were started. Of the Vienna group, W. Stekel and F. Wittels left over some minor differences of opinion. Adler followed for more weighty reasons, and Jung not long afterwards.

2. Alfred Adler of Vienna (b. 1870) was one of the earliest followers of Freud and soon became a prominent associate. His emphasis on the Ego rather than on the Libido was the main reason for his defection. He called his system "Individual Psychology". It seemed to him that Freud was placing undue weight on sexuality in the study of neurosis, and that there was something deeper at the bottom of it. This fundamental fact, he discovered, was a feeling of inferiority. Whether in a particular case there was

actual inferiority of some kind or not, the main thing was the feeling. No one can put up with this feeling, for in every one of us there is a self-assertive impulse or rather an urge towards dominance and superiority. This urge Adler called the Will-to-power. It moved the individual to strive for superiority or at least a semblance of it. There may be a real Compensation to make up for the inferiority that one is subtly conscious of, e.g. a determined effort to overcome a defect or to excel at least in some other direction. Failing a real compensation resort is had to a fictitious one. There is also likely to be Overcompensation, real or fictitious.

3. The will to power is the dominating factor in life, and its liability to frustration the source of all trouble. Frustration may come from the environment or from the nature of the individual. Thus, while the will to power can be a source of achievement, it can also be the principle of maladjustment and failure; it may strive for superiority or it may just attempt to evade inferiority.

4. The Ego is, according to Adler, specially addicted to fiction. Phantasy is not so much the imaginary gratification of the libido, as Freud held, as an easy way of escaping from the feeling of inferiority. A weak person would concoct a situation favourable to himself, or adopt a style of life or pattern of behaviour that would enable him to escape from hard realities and somehow attain to what he would consider a success. The goal of superiority he would set up is a fictitious one, representing no objective achievement. It originates from the feeling of inferiority. The neurotic's difficulty consists in keeping to a style of acting, thinking and perceiving that is altogether out of accord with reality. He strives for a privileged life in society which would lighten his burden, give him the attention he craves for, and condone his failures.

5. In the first few years of life, the child adopts a style of life that remains fixed in its broad outlines. The three great problems of life are those of society, occupation and love. In each new situation, the individual seeks a goal, which is typical of the style of life adopted by him. This is not determined for the child by heredity, but by the social environment and situation in which it spends its early years. It is very largely influenced by such circumstances as whether it is a boy or a girl, or is the child of a highly successful man, or in straitened circumstances, or a spoiled child, or an only child, or a first child or a second child, or the youngest child, or whether it has only sisters or only brothers, and so on. In short, each child being born into a peculiar family and social situation, its attitude towards society, its whole outlook upon life, is greatly influenced thereby. Sex finds a place in the general scheme, which is a constant striving towards superiority and away from inferiority. In fact, says Adler, no proper understanding can be got of the sex life of the individual, no correct estimate formed of the sex factor except in relation to the individual style of life. It is the child's adjustment to the social situation that typifies its manner of approach to the other problems of life that arise later. If that was a sound one, then the sex impulse, when it arises, will fit easily into his life and he will make a success of love and marriage; if on the other hand it was warped by excessive inferiority feeling and weakness of will, his later sexual life will show the same trait of fictitious superiority goals.

6. In dealing with a particular case of neurosis, the psycho-pathologist must find out the style of life and the peculiar superiority goal of the patient as a child, which goal the adult is still pursuing in some form or another. For this the circumstances of birth and early life are to be noted, early likes and dislikes, hobbies and incidents, aspirations and failures; also his present behaviour traits, mannerisms, etc.; and the

psycho-pathologist should take a comprehensive view of them all.

7. Adler made use of dream-analysis, but in a different way from Freud. For Adler the dream refers to the near future rather than to the past Dreams are not to be considered as the fulfilment of early repressed desires ; but as a psychic rehearsal of an important event or unsettled problem that is about to come off or to be faced. It indicates the individual's style of life and his fundamental attitude towards all such events or problems.

8. By leading the patient to understand his inferiority complex and his peculiar manner of evading it or of seeking for superiority, he is enabled to direct his activities into more practical channels and conform to a more objective situation in life, though his fundamental style of life was already fixed in its main lines.

9. Adler had little use for the concept of the unconscious, though for him it might have been the same as the inferiority complex or as style of life, inasmuch as this is little understood or noted by the individual himself. Adler's use of the term 'resistance' is very different from that of Freud, to whom it signified an unconscious opposition to the emergence of wishes long since repressed ; for Adler it is a subtle opposition to the treatment itself.

10. 'Transference' also gets an altogether new meaning with Adler; it is a mode of attaining a superiority goal, by scoring against the doctor.

11. Adler had no use for entities like the 'conscious' and the 'unconscious', or for dualistic oppositions. For him both the 'conscious' and the 'unconscious' were bound together in one dynamic unity.

12. Adler discovered that "man is not driven by his emotions; on the contrary, he produces them in order to attain his goal. All our moods and emotional crises are really very cleverly and subtly manufactured in order to see us through the difficulties of circumstances without injury to the indispensable aim of the ego..... Adler goes even further, and declares that not only emotions but also many physical sensations are thus self-induced. Painful as they are, they are useful to us..... At the same time, we must recognise that the emotional being of an individual has its own particular character: certain emotions are interwoven with certain memories, in such a way that the stimulation of each emotion evokes all its own overtones and reverberations in the life-history of the psyche. The psyche may be compared to a harp of many chords, but it is the player himself who has made it. He plays what he likes, yet the music is largely conditioned by what he chose before."

13. Dr. Rudolf Allers, a disciple of Adler, mentions, as of fundamental importance in the formation of character, two aspects of the will: the Will to Power and the Will to Community. (These, we observe, correspond to the striving for oneness within the Self and of the Self with the objective world.) Allers points out how the one tones down the other in the formation of character. If I am not one in myself, there is strife; if I am not one with the world, there is strife. Se we may have a Principle of the Ground of Emotional Disturbance corresponding to that of Perplexity: "I cannot be both one and not one." To attain unification is to be deified. "Father, I pray that they be one, just as thou and I are one." This deification by which we are raised supernaturally to be like to God is opposed to that oneness by domination by which we set into opposition and dominate—a spurious deification—the reason for the first Fall of Man, and ever since then the same reason for every subsequent fall.

14. Individual Psychology is certainly easier to understand, and to apply than Freudian psycho-analysis. Adler's scheme is psychological; whereas Freud's system is rather physiological. Adler's insistance on the unity of the person and on the importance of the will and its training is a return to notions supposed to be long dead.

15. For Adler's Principle of Compensation and Overcompensation, the reader is referred to the chapter on Character.

CHAPTER XXXII

GESTALT PSYCHOLOGY

1. Early in this century, there appeared in Germany a small school of psychology that soon gained rapid favour on the Continent. The doctrines of this school only slowly made their way to England and America; and by 1939 the new psychology had gained many ardent adherents all over the world and flourished vigorously. The leading spirits were Max Wertheimer (b. 1880), Kurt Koffka (b. 1886) and Wolfgang Kohler (b. 1887). They were working together in 1912 at the Academy of Frankfurt. Each had already done notable work in different fields of experimental psychology. Wertheimer was conducting experiments in 1912 on the perception of motion by sight, with his two younger friends as subjects. The results contributed largely to the understanding and improvement of motion-picture technique, though the main principles remained the same as were established seventy years previously by Plateau, a Belgian physiologist. That one sees motion on the screen despite the fact that what is being projected is a rapid series of still views separated by intervals of darkness, which by itself does not constitute motion, is the result

of one's organization itself. The analysis of the total experience into the succession of stills and intervals of dark blanks did not account for the motion perceived. Experiments were conducted to find out the conditions for the appearance of motion. Wertheimer supposed that the continuity comes from the brain action itself, the response to a stimulus merging gradually from one to another under suitable conditions. In other words, motion is not a mental inference, but it is actually experienced as a sensation, being itself a primary response on account of the gradual movement of the brain-process itself. The three young men went further in extending this view. Much of our experience that used to be regarded as inferences, built upon sensation or as the result of associations based on past experiences, turns out to be involved in the sensation itself. The primary response of the brain is not the result of the mere stimulation of the retina, but it depends on many factors, which form a total situation. Any single stimulation that reaches the brain fits into the totality of the brain-process, which is not an aggregation of distinct activities, but a dynamic interacting system, by which is controlled each of the separate items of stimulation. We do not have to learn to see a compact form as a unit. Seeing it is a result of the brain-process itself.

2. The German word '*Gestalt*', meaning 'shape' or 'form' or 'pattern', and sometimes rendered by 'configuration', was chosen as the key-word to the system.

3. The Gestaltists objected to Associationism not only on account of the vague talk of association links or bonds, but also on account of the atomist tendency they saw in it. They disapproved of the method of analysis into ultimate elements, whether they be sensations or reflexes or instincts.

4. Already in 1890 von Ehrenfels had brought out the importance of a *Gestalt-qualitat*, a pattern

quality, a quality exhibited by a whole and not possessed by its separate parts. The Gestaltists in 1912 insisted upon it, and emphasized the outstanding place of organized wholes in the study of psychology.

5. They were themselves a school of experimentalists, and devised experiments for the study of the *gestalt*. They studied facial expressions, other forms and figures, systems, organizations, organisms, with great pains and experimental ingenuity, and made quite evident the most ignored but most obvious fact that the whole is more than the mere sum of its parts.

6. The Gestaltists consider the distinction between Ground and Figure as of prime importance in the process of perception through vision. The ground is what recedes into a sort of blank void against which the figure is seen. This is a compact visual unit, having form and outline, drawing attention to itself. Details come in later; but the fact of seeing a unit whole by itself renders progress in knowledge by visual sensation possible. The distinction of ground and figure pertains also to perception by the other senses, *e.g.* of rhythm and melody in hearing, of feeling in touch. It is applicable also to external behaviour. Hence they conclude that this distinction of ground and figure must be taken as a basic principle in the process of the organization of experience and behaviour.

7. The experiments they devised, particularly in regard to visual perception, were directed to discover the conditions necessary and sufficient for the separation of the figure from its ground. They tried groups of dots, of straight lines, of mixtures, of marks, etc., and noted the figures that emerged. The figures were not actually there, but, as it were put in by the subject. The explanation was that by a process, which they called " closing the gap ", the figure is seen as a whole, the brain processes effecting the continuity that was actually wanting, the separate stimuli merging by a

dynamic interaction into a whole. If there is a gap, there is a disequilibrium of unbalanced tensions. Equilibrium is restored by closing the gap. Any other stimulus which would fill the gap could certainly not disturb the equilibrium. The brain-processes are always towards a state of equilibrium or of least tension. The tendency to forget all about a thing or an operation once it has been completed, and to put it away as finished, shows that the motive force arises from a tension and dissolves with the removal of the tension. The completion of an act, the achievement of the purpose has closed the gap. When a project is placed before one, tensions are generated. These are relieved by the completion of the task. The tensions correspond to a quasi-need, which is like to an organic need except for its being artificial and temporary. It exerts an urge to complete a task, or to return to it if there has been an interruption; it brings the project back to mind over and over again. Only when the task is completed is the tension relieved; does the need vanish. The goal is part and parcel of the situation in which the gap had to be closed.

8. Parallel to the tendency to close the gap is a tendency to ignore irregularities, which is the same as relegating these to the 'ground'. An imperfect figure is one with gaps and irregularities. The brain-process displays the tendency to perceive perfection.

9. The movements of the body, neck, head, eyelids and of the optical muscles to get the clearest view of a thing, must all be reckoned as one with the cerebral response to the brain stimuli in the process of visual perception. In such cases, the motor apparatus (*motorium*) and the sensory apparatus (*senorium*) form one dynamic unit or organ. Hence the separate processes of the organism are really interdependent on one another and influence one another. The organism acts as a whole. Motor responses to the environment cannot be considered apart from the

perceptual processes, because they are dependent upon these, and in these is the environment as perceived by the organism. Motor activity and perceptual activity are not mutually exclusive or independent, but pertain to the same unified activity of the organism.

10. The Gestaltists lay greater stress on the perceptual processes in the study of behaviour.

11. Kohler, the youngest member of the Berlin trio, had been making experiments on the anthropoid apes of the Berlin zoo. In 1913 he was sent to the anthropoid settlement at Teneriffe in the Canary Islands in order to pursue his researches. At the outbreak of the Great War in 1914, the islands were seized by the British, but he was permitted to carry on his work peacefully and thoroughly. In a book that he published later, he described his experiments and results. He declared that even the ape exhibited gestalting, *i.e.* it perceived the pattern of a situation, and that it showed real insight at times, perceiving what it is doing and what it has to do. If the elements of a situation are all visible together, it could combine them for its purpose. Its liveliness and interest following a sudden success, achieved after labourious trial and error and the firm retention in memory of a successful operation, point to genuine insight; while its very mode of trial seemed to come from a perception of a pattern of objects and situation. Kohler rejected Thorndike's doctrine that every animal learns by the trial-and-error way, *i.e.* that of impulsive activity, the successful efforts being impressed upon it and the unsuccessful blotted out, these processes being purely mechanical.

12. Koffka, the second member of the trio, carried the Gestalt principles into the investigation of learning. Pressing the conclusions of Kohler further, he asserted that all learning consists in insight. It

occurred to him also to fix upon Thorndike as an adversary. He showed that the case of a simple situation in which Thorndike had placed an animal and in which it turned out successful in one trial, was one of real insight, because in such cases the animal was able to see the situation together as a whole, and thus knew what it had to do, Koffka argued that by the Principle of Trial-and-Error certain responses were stamped in and certain other responses stamped out; and this sort of achievement cannot be designated as learning. The response has to be taken together with its final outcome either for the stamping out or for the stamping in; placed again in a similar situation, it has to be taken together with an anticipated outcome in respect either of its repression or of its occurrence. Moreover, according to the principle, the trial would be aimless, undirected; the animal striking out blindly, with no knowledge of its action; insight and purposiveness would be wanting. Koffka shows that such is not the case.

13. Thus Gestalt psychology lays stress on the perceptual process in doing something new, and this means a reconfiguration of the total situation with the gap between the goal and the other given elements of the situation closed.

14. One particular experimental result is held to clinch the argument and to overthrow completely the stimulus-response associationist theory of learning. Two boxes, A and B, are painted in two different shades of grey, box B of the darker shade. An animal is trained to obtain his food from box B, to which it will go directly, ignoring box A. The box A is removed and box C, of a shade darker than B, substituted. The animal walks straight to C instead of B. His response is, therefore, not to a particular shade of grey but to the scheme: lighter grey—darker grey, and therefore to a pattern, not to an isolated stimulus.

15. Kurt Lewin (b. 1890) of the University of Berlin, who became an active and prominent member of the Gestalt School, chose the association doctrine for the brunt of his polemical attacks. He it was who worked out in great detail the principle of closing the gap.

16. We shall now summarise briefly what Gestalt psychology repudiates of other current systems and what is upholds with vigour.

17. Gestalt psychology is totally averse to Atomism and all systems implying Atomism. It holds that analysis into ultimate elements is not merely futile but based on false principles. It is averse to reducing psychology either to a sort of mental dynamics, or to a sort of mental chemistry. It rejects the notion of ultimate components or elements whether they be taken as thoughts, or as sensations, or as reflexes, or as instincts.

18. The Gestaltists reject Associationism, primarily because it generally implies Atomism, and also because its aim is analysis. They reject introspection of the analytical type for this is but retrospective analysis.

19. The Gestaltists have no objection to instincts, but to these being considered as ultimate elements of behaviour; they are as much opposed to simple reflexes for the same reason.

20. Gestalt psychology insists on organised wholes and on the worthwhileness of the study of their properties, for which analysis is futile. It holds that personality is a whole, that the *gestalt* is the fundamental problem of psychology, and that experiments are usefully directed only when devised to bring out the *gestalt* or the conditions for a *gestalt*. Gestalt psychology lays stress on the perceptual

aspect of activity. It holds that we do not have to learn to see a whole ; we just see it.

21. The explanations given by the Gestaltists is physiological; we see motion because the brain-processes merge into one whole activity ; we see an object as a unit, because the brain response to the stimulation of even one area is a total activity and not the mere sum of separate activities or of separate responses by separate brain areas ; further, what occurs at one point of an organism is never isolated but always bound up with what is happening at another. They claim that sensation is a gestalting of brain activities and that it includes perception. They claim that motor activity and perceptual activity together form but one activity with its own gestalt.

22. The Gestaltists hold the distinction between figure and ground to be of fundamental importance in visual perception, and also in the organization of experience and behaviour. They assert that the fundamental tendencies are to close the gap and overlook irregularities. They attach definite importance to goal-seeking, which is also a tendency to close the gap. Even solving a problem when faced with a given situation is a closing of the gap, for it is a reorganization of all its elements together with the goal in view so that the gestalt of perception and behaviour include and lead up to the goal.

23. There is a great deal of value in the results of the experiments of the Gestaltists. What they lay stress on bear the marks of factual truths, and are rightly chosen as having been much neglected by psychologists in general. Their extensions and their explanations need not be accepted. They rightly insist, just as Adler does, that man is one in his behaviour and experience, an organized whole.

24. The Gestaltist's 'purpose', however, is only the need for a mental gestalt and arises purely from the physiological tendency to close the gap. The goal, he considers, is never anything more than what has been set up by a situation, of which the self with only its physiological needs is an element; and what has been set up as the goal is only an empty gap. The spontaneity he speaks of is but that of biological reactivity. We note that 'Gestalt' is akin to 'plan'. But plan implies something more. Gestalt savours too much of geometry. Nor does the insistence on 'perception' satisfy us; for this perception is only the gestalting of the brain activities, and is itself reduced to and included in sensation. 'Insight' is only gestalting. A cerebral gestalt is the same as what we ourselves call 'physiological image'. Gestaltism never considers the higher activities of man as man; rather is it inclined to generalize from the ape to man. It has no proper place for Willing, or for Thinking. Its explanations are purely physiological, and thus it does not raise Psychology to a higher level. It courts Materialism. The explanations, moreover, seem to suggest that, in all cases, unity and wholeness, are perceived merely as the result of the dynamism of the cerebral activities and are not there in the object. This is because the cases dealt with were those of geometrical unities and wholes. The suggestion may not be intended; it may even be ignored, as the Gestaltists will have nothing to do with philosophical implications. Neither have the Gestaltists dethroned Associationism. Certainly wholeness is an important item; but the whole has parts and the inter-relations of these parts in and through the whole—not independently considered—is worthy of study.

CHAPTER XXXIII

HORMIC PSYCHOLOGY

1. Purposivism or Hormic Psychology dates from the year 1908 when William McDougall (b. 1871) brought out his first remarkable work, *Introduction to Social Psychology*, which immediately caused a great stir both among psychologists as well as among sociologists. It was the first elaborate attempt to formulate a social psychology, or to apply psychology to social problems. Psychology for some time had been engrossed in the study of learning, of memory, of reflexes, of sensations, of habits, etc., and no psychologist had taken up seriously the study of men in the mass, in particular of the motives of social grouping and behaviour. Historians and sociologists were not professed psychologists; but they did obviously have a need for psychology in their work, and each had a rough improvisation to suit his purpose. Thus McDougall stepped in to fill a need which had long been only vaguely felt but was now immediately acknowledged.

2. McDougall had studied and worked in Cambridge, London and Oxford; later on he crossed over to the U.S.A., where he worked in Harvard and Duke Universities. He held that emotion was the more dominating factor in man's life than reason, and that the study of motives was of paramount importance. For this, he said, introspection was unsuitable, for it was easily turned into retrospection. Most of man's actions are not dependent on foresight, but they are very much dependent upon desires. Purpose commonly implies both foresight as well as desire; a foresight of the outcome of an action and a desire of the consequences. However, for McDougall it is the striving or seeking that is of importance as the basic fact, not the foresight. That is why the Greek word horme ("urge"), which has a wider significance, came to

replace 'purpose' and the system came to be designated by the term 'hormic psychology'.

3. For McDougall horme is the fundamental psychological fact, the basis on which his system is built up, to which all other facts are subordinated, round which human behaviour centres. Human conduct can be traced back to primary motives or 'instincts'. These set up the ends and direct the course of activity: intellectual processes are but means to the ends set up. An instinct is not merely motor, it is mental as well; with it is wrapped up a special emotion and even a mode of behaviour. It is a primary motive, itself the ultimate source of action. It has three aspects: it predisposes the individual to take note of certain stimuli; it gives a tendency to a particular behaviour; and at its very core is the emotion. There are major and minor instincts. The latter, such as sneezing and urination, are of little significance in social life, though they may at times be very strong. The major ones provide all the primary motives which would account for social groupings and all social activities.

4. McDougall defined instinct as "an inherited or innate psycho-physical disposition, which determines its possessor to perceive and to pay attention to objects of a certain class, to experience an emotional excitement of a particular quality upon perceiving such an object, and to act in regard to it in a particular manner, or at least to experience an impulse to such an action." Thus each instinct involves a selective perception, a proper emotion, and a peculiar impulse. (McDougall did not postulate any necessary connection with or dependence on a physiological occurrence.) He postulated the existence of seven primary major instincts. Later he raised the number to fourteen.

5. Instincts are not acquired in life, but are hereditary and are the ultimate sources of energy for

what is properly called behaviour. Without them the human organism would exhibit only reflex activity, responsive only to varying stimuli. Behaviour is not only responsive to the environment, but it is to some extent spontaneous and independent of the particular environment. In it is to be noted also a persistence in a line of activity that may have originally started as a response to a momentary stimulus. That activity is variable, subject to modifications; but in spite of the variations, the goal remains the same. When it is reached, the activity comes to an end. It may be noticed also that in a behaviour-series the first part is a preparation for the next stage. When the situation bringing out a behaviour series is repeated often, the behaviour tends to get less and less varied. Thus behaviour, unlike reflexes, definitely shows goal-seeking ; and goal-seeking requires motives. The primary motives, says McDougall, is those of the instincts.

6. The core of an instinct is the emotion proper to it ; this remains practically the same through life, but the perceptions and the movements of the instinct are subject to variation and modification by experience, the perception and impulses can become attached to new objects or stimuli, and the movements modified greatly by learning and experience. Actions apparently very different may be traced to the same instinct, because at the root of them is the same emotion.

7. Moreover, instincts are subject to modification by combination. Thus a complex attitude or sentiment is a combination of several instincts, originally distinct. The combination is brought about by several instincts getting attached to the same person or object or situation. Thus is generated a complex sentiment, which becomes a new driving force in behaviour.

8. McDougall gives great weight to two instincts, self-assertion and submission. The former motivates the striving for superiority, and the latter exerts a moderating tendency. (This would remind us of the will-to-power and the will-to-community of Adler's Individual Psychology.) These two instincts combine together into the self-regarding sentiment, which is of the utmost importance in self-control, morality and achievement.

9. The hormic psychologists have been at great pains to examine the complex sentiments and attitudes of adult life so as to make out their different instinctive sources. All human individual behaviour, they say, is motivated by instincts and sentiments, which are themselves ultimately built out of the instincts and never lose their emotional qualities. The same is true of social behaviour, which, however, is based not directly on the primary instincts but on combinations of them. The moving into social groups is due to the herd-instinct; but with the fact of grouping all the instincts come into play and get adjusted to the social situations arising, and combine into social sentiments, by which all sorts of social behaviour are motivated.

10. McDougall's work had a great effect. It aroused much debate. Social psychology was soon introduced into university courses. Many works on this subject were rushed into print, more or less on the lines of McDougall; though with some innovations and modifications. A heated debate took place on instincts. Professed sociologists were not in favour of McDougall's scheme of instincts of the individual. They preferred to explain many of them as the result of the impact of society upon the individual. The individual is born into society, which is there already before he is. He behaves as he does, 'like a human being', because of the culture he receives from it. Gradually, the doctrine of instincts being the founda-

tions of social and even individual behaviour, found less and less favour; not only because no two psychologists agreed on the same list of instincts, but also because it seemed that many of the instincts enumerated were acquired tendencies of behaviour, without the marks of inheritance, and acquired mainly by the contact of the individual with society. Instincts could not be denied, but undue emphasis on them was not justified. It was language, customs, institutions, and the like, built up by society, that moulded the individual in the main, and the influence of instincts on his behaviour was of minor importance, being largely subordinated and suppressed in the highly artificial environment of human society. McDougall himself, however, had allowed largely for the modification of instincts by environmental impact.

11. Many psychologists also rose up in arms against the doctrine; some because they would not acknowledge that complex behaviour could be hereditary; some because the conditioned reflex could substitute what might so very readily be mistaken for an instinct. Much of the discussion was beside the point; for though different behaviour patterns may be acquired, yet they may all have the same primary motive. However, there were greater objections. The concept of instincts as driving forces or entities was on a par with the supposed Newtonian concept of 'force', and with the 'faculties' that were in vogue at one time; they, therefore, savoured of fiction. Moreover, the length of the list of primary instincts and the variations in the different lists made up by the Purposivists, did not please those who looked for simplicity, preferring to have the two great instincts of Freud or the single libido of Jung.

12. Mc Dougall believed that he escaped from Materialism; but though his sources of behaviour are not directly dependent on bodily constitution, yet ultimately even the instincts must trace their origin to

it. McDougall has no place for free-will and hardly any for reason. On this score alone he is condemned by many; for not all psychologists have discarded these concepts. McDougall's 'purpose' is a blind one, and however loudly he proclaims its primacy as a psychological fact, by neglecting reason and will he has himself left the bag open for the escape of his cat. For there are very many, *e.g.* Behaviourists, who would reduce purpose to a pure physiological condition. Several minor instincts, *e.g.* hunger, thirst, fatigue, drowsiness, have been reduced to behaviour tendencies, determined by 'tissue-needs' or chemical conditions of the organism, or by organic states produced by secretions of the glands. (*cf.* the ancient notions implied by the words "melancholy", "choleric".) Some of the major instincts, *e.g.* the sex-urge, have been described in a similar way as physiological states. Purpose has itself been reduced to a setting, a cerebral or organic adjustment, which would account for persistence in an activity momentarily aroused by a stimulus but maintained till the goal is reached.

13. Typical human behaviour is indeed purposive; in the sense in which the common man has always understood the word, not in the sense of being shaped by predirected instincts. Each instinct of the Purposivists has its own direction given by Nature, and 'purpose' for them is only this directedness. Thus there is no distinction between man and brute animal; indeed, even, in the activities of plant ife there is a 'horme' in this sense. McDougall himself holds that horme can be applied to all behaviour which exhibits goal-seeking. He even sees horme in the inanimate world of Physics and Chemistry and discusses the possibility of science being treated teleologically and not mechanically. In a way, taking it in the wide sense given to it, we do see horme and significance in the world. This is nothing new. Centuries ago, a teleological proof of the existence of God was put forward, the basis of it being

the purpose seen to run through all the events and entities of nature. But it is a philosophical conclusion; and whether it would be advantageous to consider it the basic fact of a system of psychology is very doubtful. While our direct study of things may be of choice a mechanistic one, it need not necessarily exclude purpose; for purpose has been the inevitable conclusion of all our studies, however mechanistic they be. By reducing it to physiological processes we do not get rid of purpose (in the wide sense) in each of them considered singly, though we lose sight of the purpose of the whole series. If, however, purpose is to be the basic fact, we must not ever lose sight of this. That the whole should have a quality not found in the sum of the parts, is itself a demonstration of purpose in the whole. That the part is ordained to the whole is a horme; that they are ordained to each other, and that each has its own activity and reactivity.

14. The special hormic energy that McDougall speaks of seems to be little different from physical energy. That is another reason why we said that he had left the bag open for the escape of the cat which he was at so much pains to capture.

15. The essential facts of mental activity that hormic psychology keeps in the forefront are perception of a situation, anticipation of results, a striving towards a goal and satisfaction when the goal is reached. Inasmuch as these were often ignored, hormic psychology has done a service by insisting on them. It even speaks of values, based on the striving and satisfaction; but how there can be place for intellectual and moral ones, we fail to see, for hormic psychology ignores the intellectual element of perception and the moral element of the setting up of the goal and the striving for it. The ends of action are never set up intellectually, but always instinctively, or ultimately so by modified instincts and sentiments. The striving is not directed by the will, but is directed

also instinctively. Any spontaneity in behaviour and independence of the environment is due to the independence of the instincts themselves.

16. McDougall believes that the acceptance of purpose as the basic fact is sufficient to establish what is called the principle of 'teleological causation', *i.e.* that a striving towards an anticipated goal exerts a real influence on a course of events. His extension of purpose, however, to the animal world, further to the world of life in general, and still further to the inanimate world, deprives the term of all that special significance which it would have if applied exclusively to human beings; and not only does it take the concept out of the psychological plane into the realms of philosophy but it also deprives man of a characteristic trait and psychology of one of its most fundamental facts. That a purpose runs through the whole of history is a point of philosophical value, and McDougall deserves credit for bringing it out with such force; but even here the point loses most of its value as much as the concept has lost its proper significance. While it is true that the effect of society on the individual is enormous, it is also true that each individual contributes his share, real though trifling in general, to the moulding of society. Sociologists would do well to bear this in mind.

17. Dr. C. E. M. Joad says: "McDougall only rescues our minds from slavery to our bodies, only to enslave them to the instincts."

CHAPTER XXXIV

BEHAVIOURISM

1. Experimental Psychology is a fruit of the XIX Century. Owing to the great and rapid strides in chemistry, psychologists began to look to analytical methods of studying mental processes. Physiology had a more profound influence, because the chemico-psychologists only dwelt on theory and the results of introspection alone, and they were concerned with the analysis of 'ideas'. Physiology indicated practical methods, and analysis turned to sensations. Weber, a German physiologist, in 1834, showed as the result of experiments that the increment necessary to be added to a given stimulus in order to awaken a sensation consciously distinguishable from the former sensation varies with the force of the former stimulus. He concluded that the minimum appreciable increment in a physical stimulus bears a constant ratio to that stimulus. Fechner, pursuing Weber's line of investigation, formulated in 1861 the law in greater detail. Looking for some fixed unit by which to measure sensations, he thought he saw such a unit in the least observable difference between two sensations, which difference he assumed to be constant for the same sense, whatever be the intensity of the sensations, excluding the extreme limits. With this as a working hypothesis he showed that sensations formed an arithmetical series while the corresponding stimuli progressed geometrically, so that sensations varied in the same proportion as the logarithm of their respective stimuli. Thus the number of units in a given sensation (considering the unit of sensation to be the just perceptible increment above zero, and the unit of stimulus to be the increment of stimulus which just brings this about) is given by multiplying the logarithm of the stimulus R by a factor C which is constant for the particular kind of sensation: $S=C \log R$. Fechner called this the *Psychophysische Maasformal*. Fechner's

belief in a least observable difference and its constancy was shown to be wrong. Hering raised objections to the Weber-Fechner psycho-physical law on serious grounds. Fechner believed that his law expressed a relation between physical stimuli and psychical reaction or one between body and soul, and that it was an ultimate law for which no further explanation could be given. Some held that the law was a purely physiological one describing the relations between the external physical stimulus and the nervous action that reaches the brain. The physiological stimulus increases more slowly than the physical stimulus owing to the augmentation of resistance and friction as the sphere of cerebro-neural disturbance gets larger, and the conscious reaction increases directly as the intensity of the final physiological stimulus. Others, *e.g.* Wundt, held it to be a psychological law expressing the relation between our sensations and our powers of discriminating between them. Discrimination is relative to existing states. The differences between mental states are determined by their relation to these states, diminishing in proportion to the intensity of the latter.

2. The 'absolute sensibility' of an organ or part an organ was measured by the minimum perceptible stimulus, or in the Herbartian conception, by that which just rose above the threshold of consciousness. The absolute sensibility of the skin to tactual pressure remained constant in a small area but varied in different areas; so also for the absolute sensibility of the skin to temperature changes. The absolute sensibilities of hearing and of seeing were also measured. In the attempts to verify the Weber-Fechner Law it was found that the results varied too much for its acceptance. Thus Fechner's assumptions had no basis in fact. Not for this reason alone, but for the reason also that the results depended entirely on introspection, or rather retrospection and memory,

the law was finally discarded. Weber's original law, however, cannot be denied.

3. Wundt in his laboratory at Leipzig, started in 1879, conducted experiments on new lines. He worked on reaction-times. He insisted on having definite recorded observations and refused to rely on memory and common experience. Wundt and his followers made introspection methodological. Objective results were really attained. The Method of Impression was adopted. Muller (b. 1850) and Ebbinghaus (1850-1909) studied memory. Galton invented tests for measuring an individual's performance. Titchener and Alfred Binet of Paris (1857—1911) studied the process of thinking and learning; so also Kulpe and his colleagues.

4. All these experimentalists studied experience as reported by the subject. Thorndike introduced animal psychology in 1898 and worked at it for many years. Since then performance rather than experience came to be regarded as objective.

5. The aims of psychology itself underwent changes. Psychology, originally 'the study of the soul', became successively 'the study of the mind'; 'the study of mental states'; 'the study of mental structure'; 'the study of mental processes'. It then become in turns 'the study of consciousness', 'the study of mental performance', 'the study of conscious states', 'the study of conscious experience', 'the study of conscious behaviour', and finally 'the study of behaviour'.

6. Prof. Cattel (b. 1860), an American follower of Wundt and of Galton, already in 1904 spoke of the study of behaviour as being the most fruitful, and of the possibility of investigation without introspection at all. McDougall in 1905 (*Physiological Psychology*) defined Psychology as 'the positive science of the

conduct of living creatures', in which, however, he was willing to include conscious experience. In 1908 (*Introd. to Social Psychology*) he defined Psychology as 'the positive science of conduct or behaviour', meaning 'the positive science of the mind in all its aspects and modes of functioning'. Introspection was only preliminary and directive; but the science needed objective methods and a more solid basis, which was, he said, the observation of the behaviour of men and of animals of all varieties under all possible conditions of health and disease and in various situations.

7. W. B. Pillsbury (b. 1872) in 1911 (*Essentials of Psychology*) defined Psychology as 'the science of human behaviour'. Its theoretical aim was to determine that on which human capacity depended, and its practical purpose was 'to discover means of increasing man's efficiency'. Its method was both external observation as well as recording conscious experience.

8. 'Behaviour' is doubtlessly a word of wide significance which could very well include even sensation and conscious experience. But the word suggests rather external performance than experience.

9. In the American universities at the end of the last century 'structural' psychology was in vogue. It was a study of conscious experience, and it aimed, as its name implied, at a description by analytical methods of the structure of experience. Along with this, however, arose a 'functional psychology'. It was introduced chiefly by William James of Harvard University. It aimed at showing the part that consciousness played in the life of the individual, by investigating the needs of the organism that were met by sense perception, mental images, emotion and thinking. Accepting the evolutionary hypothesis, it sought to discover at what stage in the development of the race the need for each mental process became sufficiently pressing to bring about the emergence of

that particular process; the assumption being that with the growing need for greater and greater and more and more flexible control of the environment mental processes arose and developed. Thus functional psychology was seeking a place for itself in biology. G. T. Ladd of Yale wrote on the physiological mechanisms of mental life; G. S. Hall of Clark University on the development of mental life in the child and in the race. At the University of Chicago J. R. Angell (b. 1869) worked on the lines of James. Max Meyer (b. 1873), at one time a pupil of Carl Stumpf of Berlin, was a contemporary of Wundt. In his *The Fundamental Laws of Human Behaviour* he declared that if Psychology would be a real science it must consist of a knowledge of the laws of nerve-action. He endeavoured to develop laws and schemes of neural action that could explain all the facts of human behaviour. He accepted introspection only as an aid in discovering the laws of nervous function, as throwing light on performance; not as a description of experience.

10. John B. Watson (b. 1878) studied and worked firstly at Chicago, and later at John Hopkins. From animal psychology he went on to child psychology. He was acquainted with the work of all the experimental schools and with the prevailing trends of thought. However, he was getting more and more dissatisfied not only with the aims but also with the methods of his contemporaries. Already in 1912 he decided to make psychology a thoroughly objective experimental branch of natural science, by leaving out 'intangibles and unapproachables' such as 'consciousness', 'mind', 'mental state', 'mental content', 'will', 'image', and the like; discarding introspection altogether, and only confining himself to observations of external behaviour.

11. In 1914 he published *Behaviour: An Introduction to Comparative Psychology.* In it, taking the cue from Pillsbury, he defines psychology as the

science of behaviour, a purely objective experimental branch of natural science, its theoretical goal being the prediction and control of behaviour. He says that psychology can be expressed 'in terms of stimulus and response, in terms of habit formation, habit integration, and the like'. It should aim at gaining 'an accurate knowledge of adjustments and the stimuli calling them forth', so that we may learn 'general and particular methods by which behaviour may be controlled'. He criticises the use of introspection and would have no use whatever for it as a method. He would have results of experiments on the human being to have the same objective value as those of experiments on animals. Watson was as keen on promoting objective psychology as he was on elimination of everything else. Behaviour had already been accepted largely as the subject matter of psychology, but Watson wished to give it a limited sense, to make it exclusive of consciousness; in practice, to keep out introspection and all reference to consciousness.

12. The rapid growth of animal psychology, started by Thorndike, in which Watson himself had specialised, accounted for this bias to pursue the same methods in human psychology.

13. Watson resented the criticism of animal psychology made by those who held psychology to be the study of conscious experience, *viz.* that if behaviour data were not expressed in terms of the animal's consciousness, it could not be psychology Consciousness, he said, could not be proved in animals at all, but only assumed by analogy, and as regards the animal's conscious experience this also could only be known by analogy. Some were willing to grant that animal psychology was an indirect and subordinate part of our study. Watson pointed in triumph to the mass of objective results achieved in animal psychology, and in derision at the perpetual controversies raging among those who made use of introspection, *e.g.* on imageless-thoughts.

14. Watson's antagonism to introspection was not only on account of its defects as a method, so often already pointed out by others, but also chiefly because the introspectionists claimed to observe what Watson held to be of no real existence, intangibles, unapproachables. For him 'consciousness' seemed to be but a word substituted for 'soul', and could not be accepted in this 'psychological sense'. He later admitted that one could observe one's own behaviour and report; but he would not accept any reference to consciousness in the report.

15. With consciousness, Watson cast 'sensation', 'feeling' and 'image' out of the realm of psychology *i.e.* not only consciousness but the supposed 'elements' of conscious experience. He avoided these expressions, by using the terms 'response', 'stimulus', 'reaction'. He redescribed the results of objective experiments, even those of the method of impression and report on sense-experience, in these terms.

16. Watson would not accept 'memory images as such. He took them to consist of sensations—he avoided this expression and used 'kinesthetic impulses' instead—and verbal responses. Feelings of pleasantness and unpleasantness he reduced to sensory impulses from the sex organs and other erogenous zones together with the incipient movements of going to or away from an object. The brain was not the origin of either image or feeling, and these could not be other than stimulus-response behaviour. Indeed, all behaviour was sensorimotor: a stimulus-response reaction or a series of them, each originating with a sensory stimulus and ending in a muscular or glandular response. Sensorimotor behaviour is not the product of the brain alone. The cerebro-neural system functions in a complete cycle. Feeling and memory and thinking are not centralised in the brain; they are not distinct from sensorimotor behaviour; they are subject to objective methods of observation, and there is no need of or advantage in introspection.

17. Watson notes that behaviour may be internal or 'implicit'; not always explicit or immediately detectable from without. There is sensorimotor behaviour going on within and not directly observable, *e.g.* that of the stomach and of the viscera. Thinking is such. It is nothing more than inner speech, consisting of imperceptible speech movements too slight to be detected as visible or audible movements. We should invent apparatus for the purpose of recording implicit behaviour.

18. Behaviour is made up of instinctive responses, which are not learned, and habitual responses which are learned. These responses, instinctive or habitual, may be either explicit or implicit. A fruitful line of research is to investigate the development of the explicit and implicit learned responses of the individual; for this knowledge can be usefully applied to control and improve human behaviour.

19. Such was the Behaviourism as expounded by Watson between 1912 and 1914. He wrote profusely. The work by which he may be said to have definitely established Behaviourism, was *Behaviour: An Introduction to Comparative Psychology*, 1914.

20. When the work of Bechterev and of Pavlov on the conditioned reflex came to be better known in America, Watson greeted the discovery and the methods used by the Russian experimenters as most useful to his own system. The complete objectivity of the results was just what he admired, and he suggested the substitution of the Russian methods of experimentation for the verbal report, which for him still savoured of introspection. In his *Psychology from the Standpoint of a Behaviourist* (1919), Watson gave a high place to the conditioned reflex and to the experimental method. He extended the notion of conditioning to the emotions, and said that the fear that arose in certain situations came under the class of conditioned emotional reactions.

21. In 1921, Messrs. S. Smith and E. R. Guthrie, followers of Watson, proposed in their joint production *General Psychology in Terms of Behaviour* that all learning should be regarded as based on the conditioned reflex.

22. In 1924, in his *Psychology from the Standpoint of a Behaviourist*. Watson held that the clue to the understanding of habit formation and of the integration into complex learned acts of sensorimotor responses, was to be found in the conditioned reflex.

23. Thorndike's explanation of trial-and-error learning was, as we have seen (see Ch. on *Instinct and Learning*), given in two laws: the Law of Exercise and the Law of Effect. The wording of the latter seemed to Watson to imply consciousness or at least the conscious states of pleasantness and unpleasantness, and to assume that the law worked inasmuch as these were conscious. Watson sought to do away with the law altogether by reducing it to the Law of Exercise. His attempt was not very successful.

24. Watson thought that by considering motor behaviour as the activity of the whole organism, unlike physiology, which, as he said was concerned only with the organs considered separately, he had refuted the criticism that Behaviourism was merely 'muscle twitch psychology'. He did not see that sensorimotor responses alone are not the whole activity of the human being, since he completely rejected sensation, perception, thinking, desiring, emotion, and memory, from the field of study. Watson admitted the verbal report method; but every verbal report in some way reports sensation, feeling, perception, thought, either directly in the report itself or in the choice of words, its intonation, and its implications. The words "I see blue", is not the report of a mere sensation; there is perception reported, just as if I said "I see a blue object".

25. Watson did not wish to speak of emotion but of 'implicit' visceral reactions; he regarded the feeling of familiarity as the revival of old visceral responses, and memory as the retention of skill and of facts, finally defining memory as 'an exhibition of manual, verbal, or visceral organization, put on prior to the time of the test'. Thinking itself was for him only implicit speech reactions or subvocal talk.

26. Watson's doctrine of emotion is that emotion consists of profound changes of the bodily mechanism as a whole, but particularly of the visceral and glandular systems, each separate emotion being a particular pattern of such changes. The overt or explicit emotional responses are movements of the limbs and muscles, but there are also implicit or covert visceral and glandular responses. Even in this doctrine Watson was not original. He closely followed James, who had given great prominence to bodily changes in emotion. (Nor was James original, for the ancients recognised these changes as significant.) Watson merely avoided the terms 'sensation' and 'feeling' in his enunciation. He did not wish to rely on introspection for evidence, though obviously the suggestion at least comes from introspection and report of internal experience. For Watson it was the physiological changes alone that were of any importance. Even if the visceral and glandular activities could not be directly studied, they would be sufficiently indicated by blood circulation, blood pressure, blood composition, respiration, etc. Experiments did not succeed in getting well-defined patterns of emotional response to correspond to pleasant and unpleasant sensations or to the verbal report of the subject. So two different emotions could only be distinguished as two different patterns by taking into account also non-visceral behaviour and the situation in which the subject is placed. Certain patterns of internal processes, of pulse, blood pressure and stomach movement, had already been

found to depend on the action of the systems of nerves uniting viscera and blood vessels in common nervous action and on the secretions from the adrenal glands. But such patterns were detected in excited states similar to those obtained in fear and anger but with no fear or anger, and therefore could only by analogy be called states of fear or anger. It was held, therefore, that the differences arose not only from the explicit reactions or from the setting for them but also from the different situations.

27. Watson discovered only three clear patterns of emotional behaviour in the new-born infant, fear, rage and love; these he described in terms of explicit response and situation, not in terms of implicit visceral behaviour. These are the only unacquired emotional patterns, all the rest are habits acquired by the process of learning. The natural stimuli for the emotional pattern of fear in the infant are loud sounds and loss of support. A loud sound evokes a reflex start and the explicit responses of fear. Fear may be conditioned in regard to an external object, and as such it may persist in life. Thus may arise many irrational fears and prejudices of later life. The stimuli for the emotional pattern of rage are restrictions to free or natural movements. Those for the emotional pattern of love are gentle patting and stroking.

28. Watson's attitude towards instincts and all hereditary mental tendencies is characteristic of him. He rejects them all and asserts that with proper environment and training any normal child could be made into any type of specialist he might select—doctor, lawyer, artist, merchant-chief, and, yes, even beggarman and thief—regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors! Watson had a penchant for startling innovation, which he showed chiefly by the vigour of his negations, particularly of what had been common belief. In 1914 he spoke much of instincts; in 1949,

though disagreeing with the lists of human instincts as given by James and Thorndike, he still conceded a number of instincts to man and recognized the importance of instinctive activity in the process of learning. In 1924, he denied all instincts and hereditary mental traits, and was an extreme environmentalist. He sought to explain in behaviouristic terms all those activities commonly referred to as instinctive. His flair for novelty led him to extremes.

29. Watson contrived to speak of sensation and memory, and even thinking and emotion in behaviouristic terms; but his explanation of thinking and behaviour contained a hypothesis which could be subjected to experimental test; moreover its acceptability is based on introspection. To Watson thinking is implicit behaviour. The child says aloud the name of an object he is looking at or touching or hearing or smelling or tasting, and also when he is doing something. This speaking aloud becomes a conditioned behaviour attached to the actual sensorimotor responses. Speech then becomes a talking to himself, finally a sort of sub-vocal talking, an implicit response. Watson includes gesture-language as well as spoken language in the process, and is willing to include other movements that could become implicit; but he lays particular stress on the movements of the organs of speech: a particular implicit behaviour substituted for the actual movements of the organism consists mainly of speech movements.

30. To Watson, thinking is not merely silent speech but it consists of these subtle sensorimotor responses. It is not enough to refer to common experience of a sort of inner speech when thinking, framing words inaudibly, or to resort to introspection for the acceptance of his theory. He saw that it would have to be tested out objectively. He hoped that by the invention of a delicate recording apparatus to detect the subtle movements of the speech organs, his

theory would be confirmed. Several apparatus were invented, but though some movements have been registered when a subject thinks over a sentence, the records do not show any correspondence with the speech movements that are made when the actual thought is spoken aloud in words. The hope is still that more sensitive apparatus will show a definite correspondence, and that instead of the larynx an examination of the respiration will give better results.

31. Many weighty objections have been raised to the identification of thought with speech, *e.g.* the difficulty of getting the 'right' word, the ability to say one thing and think of something else, the difficulty of explaining how one can think of something new, and the greater importance to the subject of the sensation itself than of the words to describe it.

32. In this connection we also have much to say. Firstly, Watson's hypothesis was suggested by introspection, and so far the acceptance it has received is based on the experience of many, obtained by introspection; experiments are directed only to verify it. Again, Watson's stress on inner speech would leave no room for thinking for those born dumb. Even his extension to hearing reactions will deprive those born deaf and dumb of thinking; a further extension to gesture language will deny thinking to those born blind, deaf and dumb.

33. Thinking would be very much restricted for those who have become blind, deaf and dumb in adult life.

34. Hollingworth gives a broader hypothesis in his ***The Psychology of Thought*** (1926). He defines thinking as the using in the solution of a problem of substitutes or symbols for the real objects and actions that enter into the problem. The symbol of an object or of a process may be another object or process, or a

word, or a visible mark, or a diagram, or even a mental image. These symbols themselves play a part in the process (physiological) of thinking. Substitution is not only of actual processes that have become conditioned and implicit, but also of symbolic processes also conditioned and rendered implicit.

35. Hollingworth's extension will not amount to much for Behaviourists; for thinking, *i.e.* substituting, would itself be an implicit movement, an actual process become conditioned and implicit.

36. It would therefore seem that if Watson's partiality to sub-vocal speech be given up and thinking be considered as any implicit movement hiddenly or implicitly reproducing by conditioning a prior actual process, the Behaviouristic conception could be accepted, even though experimental verification would have to be enormously increased. However, Behaviourism claims to be an exact science based on facts alone. How then can it take its stand on what is to be factually established in the future? Moreover, Watson does not allow for 'intention' or 'purpose' in speech—speech being taken either in the narrow sense or in its widest sense—or for 'directed expression'. He has no room for 'planning', for observing ....'relations', for 'willing'. Further, if there is any novelty in Watson's theory, how did he arrive at it? Merely by implicit conditioned responses?

37. Even if speech movements, or failing these, other sensori-motor responses, *e.g.* muscular movements and tensions—were always found to accompany thought, the question as to what kept them going would have to be considered, and whether brain action would wholly account for it. The recent invention of the electro-encephalogram (see Chap. on *Physiological Movements*) has been hailed by Behaviourists as a long-awaited event. The results ained by its use are held to be a complete

vindication of their theories. But by it Behaviourism is reduced to reflexology. Whereas, however, the reflexologists do not claim to be psychologists and even definitely reject any such study as Psychology, either as a science or a philosophy, the Behaviourists consider their doctrines and methods as psychological. The reflexologists are sincere and consistent and logical; not so the Behaviourists. Our objection is to the identifying of thinking with the physiological movements accompanying and influencing it, which we may all grant. It is to ignore the higher aspects so very obvious to the unprejudiced mind. It is like identifying a tree with its molecules, of seeing the smile of Alice's cat without the cat, a fault similar to that which at one time the Idealists committed.

38. Behaviourism does not avoid Atomism. It atomizes behaviour and sees only one aspect of it; and even this most restricted behaviour it atomizes f rther, so that what it considers finally is not MAN, but twitching flesh and tendons and glands and nerves and brain cells. And it calls this Psychology!

39. It takes away the essentials of 'sensation'; it kills 'emotion'; it shuts its eye to the core of 'directed memory' and 'directed imagination'; it removes the kernel from 'thinking'. It has no scale of values, no place for morality.

40. Watson's Behaviourism made a great hit in the U.S.A. As far back as 1914 it was hailed as a new system that would revolutionise ethics, religion, and psycho-analysis; as the most important book ever written; as marking an epoch in the intellectual history of man; as the bearer of great tidings. Watson had outlined a great programme, which was no more than a hope to control man's behaviour in accordance with the findings of science; to control the development of the individual so as to prevent psychopathic breakdowns, and even to effect cures;

to develop a child in such a way as to make of him a great artist or a great businessman or a great statesman or a great scientist. It would only require sufficient scientific knowledge of the processes involved. Behaviourism entered into new fields. It held out high hopes. Behaviouristic sociologists proposed to tackle their sociological problems on the lines of the natural sciences. The authorities of the U. S. S. R. strove to condition the people individually and in the mass, into thorough Soviet citizens, an effective part of the conditioning process being the 'liquidation' of those who had the temerity to resist, not to speak of controlled education, propaganda and censorship.

41. So far there are no indications that we are any nearer the goal set up by Watson; that man's behaviour can really be controlled on scientific lines, that man's development can be made to follow any set path by suitable treatment, that any normal child can, with proper environment and training, be made into any type of specialist you chose, regardless of the dispositions and achievements and race of his ancestors. Watson held that the reflex, the conditioned reflex, and the reflex chain would sufficiently explain behaviour and get rid of mystical or mysterious entities from Psychology once for all.

42. If we should ask: To what end does Watson or any one else seek to control man's behaviour? What direction should development take? Why? Who should do this controlling? and other deeper questions, we should immediately land ourselves into Philosophy. But behaviouristic psychology would have none of this. Yet they are questions reasonably put and expecting reasonable answers.

43. Behaviourism itself is rather a programme and a creed with an extravagant hope. Its attractiveness is a profound faith in the ability of science to direct human affairs. Cattle are bred scientifically

for beef or milk or labour. To what end or ends should man be bred and brought up? Why?

44. Apart from introducing a new behaviouristic terminology, Behaviourism has not done anything new. Its insistence on objectivity is not new, its methods are not new, the discovery of the conditioned reflex is not to its credit, nor has it succeeded in eliminating introspection from the psychological laboratory. The clue to its general public appeal lies not so much in what it has done, but in what it hopes to do; and this because there is the general desire to evade moral responsibility, to throw the blame on circumstances and on anything but on oneself, to excuse oneself for not making good or for being inferior.

45. Behaviourism does not account for the fact that one is concerned about one's own doings and reactions and that one centres the world about oneself. It seems to hold that the experimenter's interpretation of the facts before him is a mere biological reaction.

46. As a laboratory method Behaviourism is nothing new; its objective methods were already borrowed from animal psychology. As a doctrine it consists chiefly of negations—of consciousness, of sensation, of emotions, of instincts, of thinking. To be a Behaviourist it is not enough to accept its methodology. Those who call themselves Behaviourists but do not accept its doctrines, are not true Behaviourists.

47. It is no doubt true that the study of the organism and its movements is of great value to psychology; but to hold that human activities consist merely of and can be identified with such physiological processes, is to reject psychology altogether while still clinging on to the name, and to attend only to the conditions and accompaniments and visible reactions rather than to the higher aspects of human behaviour.

48. A. P. Weiss (b. 1879) of Ohio in his *A Theoretical Basis of Human Behaviour* (1925) urged that the only ultimate entities to be admitted to Psychology should be those of Physics, *viz.* the electron and the proton, or such other fundamental entities as might in future be recognised as such by physicists. Psychology should make no pretence to any set of entities of its own. All processes, chemical or biological or physiological or human, are to be recognized as consisting ultimately in the motion of electrons and protons; psychological phenomena are and can be treated as biological and ultimately as physical. Weiss invented the term biosocial to characterize human behaviour in order to show the influence of environment, particularly social environment, on behaviour, while implying that socialization of behaviour does not in any way render it less biological. Psychology is a biosocial science, intimately connected with both biology and sociology. One individual's behaviour is a stimulus to that of another.

49. Materialism has led Psychology to its final logical position, and we wonder why the name is still retained.

50. Recently the Behaviourists acknowledged some of the findings of introspection to be genuine, but they would have them enunciated only in behaviouristic terms. It has been pointed out also that there would be no inconsistency if images were accepted as patterns of implicit motor activity; thus they grant reality to images. They accept the fact of the after-image. Many find now that memory-images may also be accepted on the same grounds. Some would also accept feelings. Thus Behaviourism is leaning towards Configurationism or Gestaltism. If all these be granted, what would be left of Watson's original Behaviourism?

51. Having considered the chief of the modern schools of Experimental Psychology, it is fitting to

point out how much of man each takes into view. The Behaviourists consider man only as a living being, and not even as a conscious being. The Introspectionists accept man as an experiencing subject. The Existentialists wish to emphasize all the subject's experiences, not only what is called 'thought'; and they seem also to acknowledge man as a special being through the ages. The Psychoanalysts accept instincts and some sort of 'character' and 'personality' in man. The Gestaltists recognize 'perception' as a mental activity with a plan. The Purposivists recognize some 'purpose' in man, if only of a blind sort. The Individual Psychologists recognize the unity of man and of his activities, and they accept also Willing.

52. We doubt very much but that the wheel will turn completely round, and in the near future most psychologists will veer round to the point of view of the common man of all ages and regard man as MAN. Then will Psychology the newest be Psychology again.

INDEX

(Reference to Chapter and Paragraph.)

abnormal, -ity ix 22, xvii 5, xix 1, xxiii 12, xxv 41, 57, 69, xxix 1, 15, 77sq., 89, xxx 16
abreaction xxix 7, 11, 15, 35sq.
absolute, absolutism xiv 15sq., 18, xxi 18, xxv 16, xxviii 18, xxix 45, 85
'absolute sensibility' xxxiv 2
abstract,-ion v 8, vi 11, 55, xi 32, xii 9, 52, 81, xiv, xv 5, xvi 8sq., 15, xviii 9, xix 8, 25sq., 29, xxi 4, 6, 21, xxiii 8sq., xxv 78, xxviii 11, 16, 18, xxix 62
accommodation vi 12, 14
acetylcholine iii 30
ACH xxvii 5, 7
achievement vi 54sq., xxv 40, 67, 83, xxxiii 8
acquiescence vi 39, xi 31sq., xiv 23, xix 24, xxi 19
acquired characters ii 9, 25, vii 5, 41
acquisition xii 56, xxv 83
act (human) x 17 to 21 xi 32, xiv 7sq., xviii, xix, xx, xxi, xxiv 20, xxv 18, 21, xxvii 11, xxxv 7, 47 sq.
adaptation i 27, ii 4, vii 4, 25, 44, xxv 11, 13, 23, 31, 49, 81, xxx 4
adjustment v 30, vi 6, xxiv 6, 9, 13, 16, xxv 7, 33, 52, xxvi 24 to 28, xxvii 1, xxix 27, xxx 4, xxxi 5, xxxiii 9, xxxiv 11
ADLER viii 13, xii 3, 69, xiv 9, xxiv 21, xxv 5, 16, 21sq., 40, 48sq., 54, 56sq., xxx 5, 9sq., xxxi, xxxii 23, xxxiii 8
admiration vi 33
adrenalin iii 16, xxxiv 26
aesthetic xxvi 23, xxviii 10sq.
affection vi 30, xxix 8
afferent nerves iii 5, 19, v 11
after-image xxvi 7, 13, 16, 20, xxxiv 50
agnosia iv 17
aim (see 'end')
ALLERS xvi 16, xxiv 21, xxv 44sq., 48, xxxi 13
all-or-nothing xi 11, xvi 17
alternation of generations i 33
altruism, -istic vi 30, 35, 42, xxiv 3, 5, 15 to 17, 20, 22, xxv 11sq., 37, 47 to 88
ambivalence of instincts xxix 64
ambivert xxx 11
amnesia (see 'forgetfulness')

amoeba i 15, 25sq., 36sq.
analysis vii 26, viii 24, x 1, xi 7, xii 9, xiv, xvi 8, 15sq., xix 24, xxvi 20sq., xxvii 13, xxviii 2, 6, 9, xxix 10, 55, 57, 77sq., xxxi 7, xxxii 3, 17sq.
Analytical Psychology xxxi, xxxiv 1
anarchy xxv 51
ANGELL xxxiv 9
anger, rage vi 32, xxv 55, 68, 77, xxxiv 26sq.
anima, animus xxx 17, 22
animal i 7, 13, 36, ii 2, iii 38, v 20, vi, vii, viii 18, x 9, 21sq., 32sq., xi 4, 30, xii 6, xiii, xviii 7sq., xix 5, 29sq., xx 8, xxi 11, xxii 24, 26, 29sq., 46 to 48, 51, xxiii 3, xxv 20, 40, xxix 108, xxxii 11sq., 14, xxxiii 13, 16, xxxiv 4, 6, 10 to 13, 46
anticipation vii 47, xviii 15, xix 5, xxii 50, xxiii 9, xxxiii 15
anxiety vi 25, xxiii 10, xxv 79
apes xiii 12, xv 11, xviii 9, xxxii 11, 24
aphasia iv 13sq.
appetite iv, vi, vii 38, xviii 10
apprehension,-sibility viii 4sq., xi 7, 9sq., 34, xiv 1, xv 1, 6, xvi 7, xvii 1, 4, xix 9, 24, xx 2, xxi 21, xxiii 7sq., xxiv 1, 3sq.
arborisation xxii 27
archetypes xxx 15
areas (brain) iii 37, iv 18, xxiii 11, xxix 87, xxxii 21
ARISTOTLE vi 18, 58, 61, ix 7, 11, xii 10, 17, 45, 61, xxv 49, 70
Arithmetic xiii 7, xxii 35, xxvii 14sq., 18
art xi 9, xxvi 32
arthropods i 35
assent vi 39, xi 31sq., xv 7, xvi 5, 10, 13, xix 8, 24, xxix 59, 78, 110
association,-ism,-ist v 31, vi 11, 55, vii 47, viii 25, x 3, 18 to 32, xi 7, 27, xii, xiv 44, xv 12, xvii 1, 5sq., 9sq., xviii 7, 9sq., 11, xix 2sq., 5, 16 to 18, 22, 28, 32sq., 36sq., xxi 5, 19, xxii 41, 44, 46, 50sq., xxiv 3, 6sq., 11, xxv 33, 48sq., 79sq., 83, xxvi 26sq., xxvii 1, 10, 18, xxix 21, 24, 29, 59, 69sq., 76, 93, 111, xxx 17, xxxii 1, 3, 14sq., 18, 24
astronomy xxvi 13, 15, 30, xxviii 2
Atheism xxviii 18
atom-bomb ii 23, ix 20
Atomism, -istic vii 37, viii 71, x 1, xii 67sq., xviii 2, xxi 23, xxix 86, 96, xxxii 3, 17sq., xxxiv 38
atoms xix 33, xxi 8sq., 10, 16, xxv 16, xxvii 22
attention v 3, 8, 30, vi 8, 13, x 18, 23sq., xi 22, 27, xii 4, 9, 19sq., 34, 52, 76, 81, xv 5, 8, xvii 9sq., xviii 12, xix 2, 13, 28, 37, xxi 6sq., xxii 2, 26, 40, 46, xxiii 9, xxv 62, xxvi 26, xxvii 2, 14sq., 18sq., xxix 6, 61, xxxii 6
attitude ii 4, xv 12, xvii 5, xviii 5, xxii 48, 50sq., xxiii 2, xxv 7 33, 46, 48, 51sq., 60, 75 to 77, 86, xxvi 25, xxvii 4, 7, 21

xxviii 2, xxix 11, 13, 26, 51, 113, xxx 4, 7, 9, xxxi 5, 7, xxxiii 7, 9
attraction xix 11, 29, xxv 18, xxix 46sq.
authority xxvi 30
automatic movements iii 33sq., 53, iv 8, xviii 13, xix 10, 36, xxii 25, 41, 46, xxv 18, 21, xxvii 5sq., 11
average xix 33sq., xxi 9
aversion vi 4sq., 11, 17, 32, xi 26, 28, xviii 16, xix 13, 15
axon xxii 27
AZAM xxii 36

Baccilli i 1sq.
BACON ix 13sq., xxix 66
bacteria i 1sq.
BAIN vi 61, xii 51, 66, xviii 7sq.
BALIN-KI ii 5sq.
BEAUNAIS xxii 6
BECHTEREV iii 43sq., xxxiv 20
bees i 41, 43, vii 2, 9, 32
BEETHOVEN vi 49
behaviour x 4, xi 12, 14sq., xvi 5, 18, xix 11, 15, 30, 33sq., xx 8, xxi 1, 4, 8sq., 12sq. 25, 27, 30, xxii 28sq., 46, 49, xxiii 12, xxiv 16, xxv, xxvi 8, 32, xxvii 11, xxviii 3, xxix 24, 31, 64, 102, xxx 4, 6, 21sq., xxxii 4, 6, xxxii 6, 10, 19, 22sq., xxxiii 1, 3, 5, 7, 9, to 13, xxxiv
Behaviourism iii 42, vii 54, xxvi 32, xxvii 8, xxxiii 12, xxxiv
belief vi 40
BERGSON xxix 68, xxx 5
BERKELEY xi 15, xii 63, xxix 103
BERNHEIM xxii 6, 19, 21, xxix 4 sq.
Bewilderment vi 26
bewusstseinlage xxvii 4, 21
BINET xxii 36, 40, xxvi 15, xxvii 3sq., 7, xxviii 2, xxxiv 3
Biology, -ical, xi 3, xii 67, xiv 46, xxi 6, 16, xxv 11, 49, 55sq., 57, xxvii 22, xxix 98, 113, xxxii 24, xxxiv 9, 45, 48
Biosocial xxxiv 48
BIUNDE xii 26
BLACK ix 16
blastophyle i 32
blood xxxiv 26
body xxix 25, 30, xxxiii 12, 17, xxxiv 1, 26
BOETIUS xxiii 2
bonds of association xii 68, 70sq., xix 2, 10, 16, xxii 48, xxvii 10sq., 18, xxix 10, 77, 111, xxxii 3
BOSE iii 32
BOTTEY xxii 21
BRAHE ix 15
BRAHMA xxi 10

BRAID xxii 1
brain iii 6, 12, 16, 19sq., 36, 48sq., 50sq., 65, iv 13, 18sq., v 2, 11, vii 20, 26, 41, xvii 4, xix 36, xxi 3, 27sq., xxii 29sq., 46, xxiii 11, xxiv 7, xxix 6, 86, 88, xxxii 1, 7sq., 21, xxxiv 1, 16, 37sq.
breeding i, ii, iii, vii 32
BREUER xxix 4 to 8
bridge iii 24
brotherhood xxv 76
budding i 32
BUHLER vi 55, vii 43, xxvii 4, xxviii 2

CAESAR xxv 59
CALVIN xxi 17sq.
CAMILLE xxii 23
CANUTE xxv 46
carchesium i 32
categories xii 67, xxvii 10
catalepsy xxii 7, 9, 29
catharsis xxix 7, 9
cathexis xxix 48, 89, 93
CATTEL xxxiv 6
cause, causality, causation ix 7, xi 19, xii 47, 72, xiv 17, 39sq., xvi 7, xx 1sq., 5, xxi 7, 10, 13sq., 17sq., 21, 26, 30, xxv 39, xxvi 16, xxix 11, 18sq., 63, 69sq., 77, 97sq., 109 to 111, xxx 4
celestialism xxiv 4
cells i, ii, iii 3, 7, 12sq., v 2, xxi 8, 11, 16, xxii 27, 46, xxvii 22, xxix 86, xxxiv 38
'censor' xxix 14, 24, 50sq., 56
cerebrum, cerebral iii 21sq., xvii 3, xxii 29, xxix 86, xxxii 9, 24, xxxiii 12, xxxiv 1
certainty vi 26, 52, xxi 9
chance i 28, ii 26, xiii 14, xviii 2, xix 34
change v 30, viii 9, xi 1sq., 12, xii 34, xiv 15, 24, 36, xvi 5, xxi 13, 17, 19, xxii 37, xxiii 2sq., 12, xxiv 2, xxv 7, 39, xxix 66, 89, 109, xxxiv 26
character xvi 16, xxii 40, xxiii 2, 12, xxiv 22, xxv, xxxi 15, xxxiv 51
CHARCOT xxii 6, 16, 19, 21, 24sq., 29, 47, xxix 4, 6
charge xxix 47, 89, 91sq.
Chemistry, chemical xvi 17, xviii 3, xix 30, xxvi 13, 15, 18, xxxii 17, xxxiii 13, xxxiv 1, 48
child, -hood x 4, xiii 8, xv 14, xvii 5, xviii 9, 11, xxi 19, xxii 16, xxv 25 to 46, 51, 61 to 80, 83, 85, xxix 11, 26sq., 60, 78, 108sq., 114, xxx 4 to 6, xxxi 5sq., xxxiv 9sq., 27 to 29, 40sq.
choice xix 7, 34, xxi 7, 24, xxvii 11

Christ, -ianity xxiii 6, xxviii 11, 12
chromatin i 16, 25
chromosomes i 19, 42, ii 8, 14sq., 21sq., xxvii 22
ciliata i 23
class xiv 28
Clever Hans xiii 3sq., 10, xxii 35
'closing-the-gap' xxxii 7sq., 15, 22, 24
cocci i 1
cochlea iii 4
co-consciousness xxii 36
coelenterata i 29, 32
coelum i 34
coercion xxi 25
cognition v 4sq., 11, 21, 26, vi 20, 31, 38, 42, 50, xviii 17, xxvi 12
collaboration xxv, 84
'collective' mind (racial unconscious) viii 12, xxx 14 to 22
colloids i 6
colony i 26, 28, 32
colour v 1, 24, xxvi 9, 15, 18, 20
communion xi 10, xiv 4sq., 8, xxiii 6
Community, Will-to (see Will-to-Community)
communicator xxii 34sq.
Compensation x 13, xxv 54, 56, 60, 62 to 66, xxxi 2, 15
competition x 13, xxv 24
complex xxix 10sq., 14, 78, xxx 4, 9sq., xxxi 8sq.
complexity ii 29, xiv 26sq., 37
comprehensibility, comprehension xi 9sq., xiv 1, 9, xxi 21
COMPTE xvi 10
compulsion xxi 25
compunction xx 12
concentration x 18, xiv 21, xvi 9, 15, xxii 29sq., 46, xxix 61
concept xi 7, 10sq., xiv 26sq., 33sq., xvi 8, 15, xxiii 8, xxv 9, 30, xxvii 18, 23, xxix 68, 94, xxxi 9, xxxiii 11, 16
concrete xvi 9, 15
conditioning x 28, xi 15, xii 49, xxi 19, xxii 28sq., 46, 51, xxvii 11, xxviii 4, xxix 102, xxxiii 11, xxxiv 20 to 22, 29, 34 to 36, 40sq., 44
conduct xxv 3sq., 18, 25sq., 38sq., 48, 56sq., 68, 72, 86sq., xxxiv 6
CONDILLAC xii 64
confidence vi 23, 40, xxv 32, 36, 75, 78, 83, xxvii 4
configuration xii 71, xxxii 2, 13, xxxiv 50
configurationism (see 'Gestalt Psychology')
conflict vi 58, xiii 8, xxv 24, xxix 23, 51, 64, 94, 104, xxx 22
conscience vi 54

consciousness ii 27, iii 1, 19, 35, iv 1sq., 17, v 2sq., 8, 16, 30sq., vi 7sq., 36, 44, vii 19, 40, 45, viii 7, 9, x 7, 9, 16, 32, xi 22, 25, 29, xii 6, 19, 52, xv 12 xvii 12sq., xviii 5, xix 9, 13, 15, 26sq., 29, 33, 36, xxi 6sq., 14, 18, 24, xxii 24, 32, 36, 39sq 50sq., xxiii 3, 9sq., 13, xxv 11, 18, 28, 32, 34, 36, 39 to 41, 51, 58, xxvi 25sq., xxvii 4, 10, 21, xxviii 2, xxix 11, 17, 21 to 24, 29, 41, 50, 56, 58sq., 77, xxx 13sq., 16 to 22, xxxi 11, xxxiv 5sq., 8 to 10, 13sq., 23, 46, 51
consistency xxv 5, xxvii 18, xxviii 2, xxix 59, 78
contact v 15, 32, vi 3, 5, 30, vii 28, xi 4, 7, 9sq., 11, xv 2, 5sq., xvi 17, xx 2, xxi 6, 8, 12sq., 26, xxii 34, 48, xxv 33, 37, 49, 51sq., 63, 70, 87, xxxiii 10
contiguity xii 19sq., xxix 77, 111
continuity xxiii 1, 3, xxiv 8, xxxii 7
convergence xii 44
conversion xxix 92, xxx 5
co-ordination viii 22, xvii 4, 9, xix 7, xxi 6, xxii 51, xxiv 3, 7, 13, 16, 18, xxv 11, xxvii 18
COPERNICUS ix 14
COUE, -ism xv 12, xxii 19
courage vi 23, xxv 78, 83
craving (see 'longing')
creation vi 51, 55, xxi 15, xxv 55, 64, 69, 82 to 84, xxx 22
crossing ii 13sq.
'crossing-over' ii 22
CROWTHER iii 50sq., 54, xxi 28, xxix 98
CRUSOE xxv 49
culture xxix 113, xxxiii 10

DARWIN i 40, vii 25, ix 19, xxi 16, xxix 105
death vii 36, xi 15, xxii 14, xxiii 11, xxix 33, 104
DELBOEUF xxii 21
deification xiv 21, xxiii 6, xxxi 13
delusion x 31, xiv 42, xvii 2, xxx 16
DEMOCRITUS v 7
DEMOSTHENES xxv 59sq.
DESCARTES, Cartesian iii 25, 34, iv 11, 15, vi 61, ix 11, 15, 23, 27, x 33, xi 17, xii 57, xix 7, xxv 39
desire i 36 iv 64sq., vi 11, 17, 32, 53, viii 7, 27, xi 26, 28, xii 2, 5, xvii 5, xviii 10, xix 5, 11, 13, 15, xxi 25, xxiii 8sq., 10, 12, xxv 64, 68, 78, xxvi 1, xxix 1, 11, 28, 31, 36, 54, 64, 89, 102sq., xxx 4sq., 10, 22, xxxi 7, xxxii 2, 24
DESSOIR xxii 41
Determinism iv 12, ix 23, x 33, xii 62, xx 1, xxi, xxix 95, 97
development i 34, ii 19, xxv 13, 17, 35, 49sq., 51, 61sq, 63, 68, 69, 72, 74, 77sq., 88, xxix 26, 44, 62, 84, 106, 108, 114, xxx 18, xxxiv 9, 40

difference, differentiation iii 46, x 12, xiv 14sq., 24, 45, xxi 6sq., 11, xxiii 2, xxv 9, 37, 65, xxvi 22, xxxiv 1
difficulties of Psychology x 3, 6, 11, 14sq., xxvii 10sq., 18, xxix 68, xxx 5
directive control iii 4, v 19, vii 34, 40, x 16, xi 4, xii 2, 4, 40sq., 54, xviii, xix, xx, xxi, xxii 46, xxiii 2, xxiv 6, 11, 16, 20sq., xxv, xxvii 10, 18, xxviii 2, xxix 62, xxxiii 3, 13, 15, xxxiv 36, 39
'discharge' xxix 35sq., 93
disequilibrium xxv 39, xxx 17, xxxii 7
disintegration xxv 11
disjunction xxii 27
dissociation vi 11, xii 41sq., xix 18, xxii 12, 26, 36, 40, 43, 46, 51, xxiii 9, 11, xxiv 6
dominant character ii 9, 22
doubt xxvii 4, 6
dreams xvii, xviii 14, xxii 43sq., xxv 64 to 66, xxvi 26sq., xxix 10sq., 52 to 59, 77sq., 111, xxx 4, 9sq., 16, xxxi 7
DRUGOMIROV ii 5
Dualism, -istic xii 5, xxviii 10, xxxi 11
duration of sensation v 1sq , vi 9, 11, 58
duty vi 54, xxv 50, 75 to 77, 82

ear iii 3, xxvi 18, 21
EBBINGHAUS xii 66, xxvii 1, xxxiv 3
EDDINGTON xvi 3, xxi 1, 14, 17, xxvi 12, xxix 98
EDISON viii 18
education xii 57, xviii 13, xix 31, xxii 25, xxiv 4, xxv 2, 13, 41, 46, 61, 68, 71, 80, xxix 26, xxxiv 40
Effect, Law of vii 16 to 19, xxxiv 23
effort xxi 19, 24, xxii 9, xxiv 6, 8, xxv 24, 29, 40, 62, xxvi 24, xxix 24, 76, 94, xxxii 11
ego viii 4, x 13, xix 12 to 16, 18, 24, xx 12, xxi 19, xxii 40sq., xxiii 8sq., 11, xxiv, xxv 7sq., 51, xxix 33 47, 62, 104, xxx 17, xxxi 2, 4, 12
egoism, -istic xxiv 15sq., 20, 22, xxv 11sq., 16sq., 22 to 88, xxix 25, 33, 102
einstellung xii 20sq., 47, xxvi 28, xxvii 1, 7, 21
elan xiv 15, xxx 5
electrical changes iii 17, 19, 21sq., 49, v 2, xxix 89, 92
electro-encephalogram iii 27sq., xxxiv 37
electrons iii 57sq , xxi 1, 8sq., 10, 12, xxiii 4, xxiv 13, xxxiv 48
element, -al, -arism vii 50, xviii 3, xix 30, xxi 1, 8, 11, 31, xxv 6, 11, 21, xxvi 18 to 22, xxvii 8sq., 10, xxviii 3, xxix 86, 89, 91, 100, 113, xxx 22, xxxii 3, 17, 19, 22, 24, xxxiv 15
embryo ii 4, 20sq., xxix 108
emotion, -al v 11, 21, 26, vi 1, viii 25, xi 28sq., xix 4, xxi 25, xxii 43, xxix 6sq., 11, 35, 89, xxx 19, xxxi 12, xxxiii 2sq., 4, 6, 9, xxxiv 9, 20, 24 to 27, 39.

Empiricism xxix 100
end (see also 'finis' and 'goal') vii 45, 4, x 7, xiv 2sq., xviii 10, xix 11, 19 to 22. xx 11sq., xxiii 6, xxiv 6, xxv 12, 18, 67, 76, xxix 25, 47, 53, 102, xxxiii 3, 15
endurance xiv 14sq., xxiii 3
energy i 6, 13, iii 8sq., 27, v 1, vi 20, 58, vii 11, viii 3, xi 3, 5, 29, 34, xii 4sq., 46, 49, xiv 13, 24, 51, xviii 5, 7sq., xix 7, 27, xx 1sq., xxi 6, 16, 23, 26, xxii 25, 27, 30, xxv 16, 63, 82, xxix 46, 61, 89, 91 to 94, xxx 4sq., 8, 10, 22, xxxiii 5, 14
entities xii 72sq., xiv 24, 46, xvi 16, xix 4, 7, 9, 25, 29, xxi 2 to 4, 6, 14, 16, 18, xxv 9, 11, 21, 86, xxvii 10, 13, xxxi 11, xxxiii 11, xxxiv 41, 48
environment ii 4, vii 25, viii 24, x 16, xvi 17, xvii 7, xviii 9, xix 6, 13, 31, xxi 17, xxiv 9, 13, 20sq., xxv 7, 11sq., 22sq., 26, 37, 48sq., 68, 71sq., 87, xxix 26, 39, 42, xxxi 3, 5, xxxii 9, xxxiii 5, 10, 15, xxxiv 9, 28, 41, 48
EPICURUS v 7
epistemology xiv 33
equilibrium v 30, vii 44, xi 5, 25, 29sq., 34, xiv 24, xvi 5, xxi 9, 11, 16, xxiv 3, 5, 10, 14sq., 18sq, xxv 51sq., 55, 74, xxix 89, 104, xxx 8, 17, xxxii 7
equipotentiality iii 39sq.
error xi 12, xiv 42sq., xv 10, xvii 2, xix 33sq., xxv 86, xxviii 3, xxix 68
Ethics, -cal xv 8, xx 10, xxviii 10sq. xxxiv 40
ethnology xxix 80, 109, 113, xxx 9
EUGENE, Prince xxv 59
euten-eller xxviii 10sq., 18
evil xx 10, xxv 35, 68, 77, 79
evolution i 5, 28, ii 26, 29sq., vi 61, vii 25, 27, xiv 46, xxi 16, xxiii 14, xxv 11, xxix 96, 105, 108, 113, xxx 17, 19
example x 12sq., xix 31, xxv 33, 45, 68, xxvii 6, xxxiv 9
excitation xxii 28 to 30, 46
Exercise, Law of vii 16sq., 19, xxi 18, xxxiv 23
exhibitionism xx 14
existence xiv 44, xxvi 9, xxviii 11, xxix 70
Existentialism, -ist xxvii 8, xxviii, xxxiv 51
EXNER iv 16
expectation xvii 5, xxiii 10, xxvii 5, 15, 17, 21
experience iv 7, v 4sq., vi 14, vii 10sq., 13, 15sq., 45, 48, viii 7, 16, xi 15, xii 9, 12, xvi 6, 10, xvii 5, xviii 5, 9, xix 3sq., 11, 14sq., 26, 33, 36, xxi 1, 7, 16sq, 18, xxii 11sq., 20, 26, 37, 43, 49, xxiii 8sq., xxiv 2sq., 13, xxv 33sq., 18, 20, 25, 27, 31, 38 to 40, 55, 78, 80, 88, xxvi 7 to 11, 20, 29, xxvii 28, xxix 11, 26, xxx 14sq., xxxii 1, 6, 22sq., xxxiii 4, 6, xxxiv 3 to 9, 15, 26, 30, 32, 51

experiments xvi 17, xxi 4, xxii 18sq., 28, 36, 51, xxvi 3sq., 8 to 13, xxvii, xxviii 3sq., xxxii 1, 5, 7, 11, 14, 20, 23 xxxiv
expression xv 1, 5, 7sq., xxi 19, xxiv 4, xxv 11, 23, 51, 82. xxxiv 36, extension x 18, xi 34, xii 4, xvi 14 to 19, xix 5, 10, 16, xxii 46, xxix 66, 109, xxxii 23
extravert xxx 10, 13, 22

fact, -ual xi 17, xiv 11, xv 5, xvi 2, 4sq., 7, 11sq., 18, 20, xix 1, 3, 6, 28sq., 33, xx 12, xxi 1, 7, 29sq., xxv 39, 67, xxvi 13, 17sq., 20, 30, 32, xxviii 1, 3, xxix 23sq., 58, 61, 75 to 78, 80, 83, 86, 89sq., 93, 100, 107, 109sq., 113, xxx 16, 19, xxxii 23, xxxiii 3, 12sq., 15sq., xxxiv 2, 9, 25, 36, 45, 50
faculties iii 37, iv 18, vi 18, 58, x 17, xii 15, 77, xiv 19, xix 29, xx 11, xxi 4, 6, xxxiii 11
failure vi 32, 57
FAIRCHILD i 39
faith vi 40, xxviii 10, 12
family xxv 43sq., 68, 71, 73 to 80
familiarity vi 22, viii 5, xi 31, xiv 23sq., xvi 15, xix 13, 15, 22, xxv 31, 48, xxvii 6, 14sq., xxxiv 25
fantasy (see 'phantasy')
FARIA xxii 1
fate, fatalism xxi 17, xxxiii 11sq., xxix 85
fatigue iii 9sq., 15, 49, v 18, 30, vi 32, 53, 58, vii 43, xix 1sq., 6, xxii 30, xxv 40, 55, xxxiii 12
fear v 5, vi 41, xi 30, xvii 5, xviii 16, xix 28, xxii 25, xxv 55
FECHNER xxxiv 1sq., xxviii 12, xxix 11, xxxiv 20, 26sq.
feeding i 25, 30, iv 4, vi 35, 53, vii 38
feeling iii 51, vi, vii 31, viii 7, 21, 25, 27, x 23sq., xi 26, 29, xv 12, xvii 5sq., 9, xviii 5, 14sq., xix 9, 24, 28, 35, xxi 4sq., 19, xxii 25sq., 43, 50sq., xxiii 8sq., xxiv 3, 7sq., 11, xxv 32, 38, 40, 48, xxvi 1, 3, 9, 24, 26, xxvii 21, xxviii 3, xxix 23, xxx 10, 13, 22, xxxi 2, 4, xxxiv 15, sq., 26, 50
FELIDA xxii 36 to 40, xxiii 1, 11
female xxx 21sq.
fibrillae xxii 27
FICHTE xxv 51
fiction viii 26, 31, x 19, 29, xvi 7, 10, xix 4, 7, 29, xxi 12, xxix 66, xxx 21sq., xxxi 2, 4sq., xxxiii 11
'figure' xxxii 6sq., 22
finality xi 4, 7, 9, xiv 2, 40sq., 51 xix 20, xxv 18, 56
finis (see also 'end, 'goal') viii 3, xi 8, xiv 3sq., 10, xix 11, 14, 17 to 20, 28, 34, xx 13, xxi 19
fission i 2, 19, 25, 37
fitness xi 32, 43, xxv 40, 56, 81
fixation (mental) xxix 14, 41
FLOURENS iii 37

follow-the-leader instinct x 13
force vii 37, x 17, xii 42, 46, xix 11, 28sq., xxi 25, xxii 13, 24, 38 43, 47sq., xxiii 9, xxv 18, 33, xxix 22, 25, 29, 39, 51, 54, 61, 76, 88sq., 104, xxx 14, 21, xxxiii 11
FOREL xxii 19, 21
fore-period xxvii 7
foresight xxxiii 2
forgetting, forgetfulness, (amnesia) xii 58sq., xxix 11, 17, 19, 23, 97, xxxii 7
form (substantial) xi 2, 5sq., 22, 34, xiv 2, 18, 39, 50sq., xix 7, 29, xxi 4, 6, 18, 27, xxv 39, xxix 109
form (mental) xii 72, xiv 3sq., 9, 30sq., 39, xxvii 10
FRANZ iii 38
free-association xxix 9, 11, 24, 58, 76sq., 110, xxx 4
freedom, free-will iii 50sq., x 10, 12, xi 14, xiv 17, xix, xx, xxi, xxxiii 6, xxvii 19, xxviii 16, xxix 97, 113, xxxiii 12
FREUD, -ian iv 11, vii 52, viii 13, xiv 9, xxv 72, xxix, xxx 1, 9sq., 14, 19sq., 22, xxxi 1sq., 7, 14, xxxiii 11
frustration xxxi 3
function, -al, -ing v 6, 18, vi 6, 8, 11, 13, 15, 17, 22, 43, 51sq., 54sq., vii 11, 43, xxiii 5, xxv 55sq., 63, 83, xxvii 13, xxix 25, 77, 84, xxx 19, 22, xxxiv 6, 9
funktionslust xxv 55
future vi 40, 46, xix 5, xxi 13, xxii 50, xxiii 9, xxv 65, 67, xxviii 11, xxxi 7, xxxiv 36, 48, 52

GALILEO ix 14, 23
GALL iii 37
GALTON xxxiv 3, 6
'gap' xxxii 7sq., 13, 24
gemeinschaftsgefuhl xxv 48
Geometry xxxii 24
genes i 42, ii 8sq., 21sq., 24sq., xxvii 22
Gestalt, -ism iii 16, 18, 25, 34, iv 11, 15, vii 38, xxvii 8sq., xxxii, xxxiv 51
gestalt-qualitat xxxii 4
ghost xvii 5, 7
give-get xi 3, xix 5
glands iii 16, 18, 25, 34, iv 11, 15, vii 38, xxxiii 12, xxxiv 16, 26, 38
goal (see also 'end', 'finis') vi 54, xxv 48, 51, xxix 28, 45sq., 113, xxxi 4 to 6, 10, 12, xxxii 7, 13, 22, 24, xxxiii 5, 12, 15sq.
God xiv 12sq., 15, 17, 39, 48, xx 11, xxi 16, 18, 21, xxiii 6, xxv 69, 74, 77, xxviii 12, 16, 18, xxxi 13, xxxiii 13
good, -ness xix 5, 22, 34, xx 10, xxv 15, 16, 35, 68, 77, 79
government xx 9, xxv 13
Grace xxiii 6

'gronnd' xxxii 6 to 8, 22
group x 4, 12, 13, 22, xxiv 5, xxv 10, 16, xxvii 1, xxx 19, xxxii 7, xxxiii 1, 3, 9
group-mind xxx 19sq.
growth ii 19, 27, xxv 11, 59, 61, xxx 5, 15sq.
GURVITCH ii 7
GUTHRIE xxxiv 21

habits ii 4, iii 19, 33, iv 6, v 15, vi 12, 14, 32, vii 2, 7, 25, 41, x 26sq., xii 6, 29, 46, 49, 51, 53, xv 15, xviii 2sq., xix 22, xx 9, xxi 5, 19, 25, xxii 27, xxiii 2sq., 8, 12, xxiv 6, xxv 18, xxvii 18, xxviii 3, xxix 70, xxx 4, 15, xxxiii 1, xxxiv 11, 18, 22, 27
HAECKEL ii 30, xxix 105sq., 109, xxx 20
HALL xxxiv 9
hallucination iii 20, xiv 42, xvii 4, xxii 12, 20, xxvi 17, xxx 16
HAMILTON vi 61, xii 26, 50, 61
happiness vi 38, 49, xxi 30
HARTLEY xii 63sq.
HARVEY ix 23
harmony xiv 4sq., 11, 18, xxii 26, xxiii 9, 11, xxiv 3, 5, 15, 18, 20, xxv 55, 61, xxix 80
hate xvii 5, xix 28, xxiv 7, xxv 51, 78, xxix 11, 64
hearing iii 3, iv 17, v 3sq., 19, vi 53, xvii 1, xxv 56, xxvi 9, 12, 21, xxxii 6, xxxiv 2, 29, 32
heart iii 16, xxi 6
hedonism, -istic xxv 53, xxix 96, 113
HEGEL xiv 15, xxviii 12, xxix 45
HEISENBERG xxi 17
HELMHOLTZ xxi 16
HERACLITUS xiv 14
HERBART,-ian xii 50, 67, xxix 12, 20, 24, 89, xxx 20, xxxiv 2
herd-instinct x 13, xxv 48sq. xxxiii 9
heredity i 42, ii 13sq., 20, 24sq., vii 25, xxxi 3, xxxiii 5, 11, xxxiv 28
HERING xxxiv 1
hesitation xxvii 4, 6
HITLER xxv 59
History viii 11, 14, xvi 5, xix 37, xxv 16sq., 22, 35, 71, xxvi 30, xxviii 7sq., xxix 13, 106, 108sq., xxx 15, 19, xxxi 12, xxxiii 1, 16, xxxiv 40
HOLLINGWORTH xxxiv 34sq.
horme xxxiii 2sq.
Hormic Psychology vi 61, vii 53, xxxiii, xxxiv 51
hormones i 45, vii 2
human acts (see 'acts, human')
human race xxix 85, 106, xxx 13 to 15, 17, 19, 22, 9
HUME xii 63, 65

humiliation vi 34, 36
humility vi 4, xxv 52, 77
HUXLEY xxi 16, xxix 105
hypnotism xviii 14, xxii, xxiii 14, xxix 2, 4 to 7, 9, 22
Hypostatic Union xxiii 6
hysteria xxii 16 to 19, 25, xxv 44, xxix 4, 7

Id xxix 62sq.
idea vi 20, viii 22, 24, xii 11, 46, xiv 16, 25sq., xvi 9, xviii 14sq., 16, xix 9, 12, 14sq., 24 to 26, xxi 6, 18, xxiii 11, xxiv 5 to 7, xxvi 8, 12, 27, xxvii 1, 10, xxix 24, 29, 45, 51, 62, 66, 69, 89, xxx 15sq., 20, xxxiv 1
ideal, -isation xiv 36, xv 15, xix 14, xxiii 11, xxv 7, 33, 37, xxix 62sq.
Idealism, -ist ix 23, xvi 9, 15, xxi 6, xxvii 8, 10, xxviii 4, xxix 2, xxxiv 37
identity, -tification vii 23, xii 27, 29, xiv 12, 14sq., 27sq., 48, xvi 16, xix 34, xxi 8, xxii 40sq., xxiii 2, 10, xxiv 2sq., 8, 11, xxix 63
illusion iii 19, xiv 42, xv 12, xvii, xix 3, xxi 7, 30, xxii 11sq., 43, 45sq., 51, xxiii 9, xxvi 17
image, imagination iii 19, v 7, 16, 21, 24, 31, vi 7, viii 4, x 18, xi 24, 27, xii, xv 2, xvii 5sq., 10sq., xviii 4sq., 9, 14, xix 2, 9, 14sq., 26, xxi 4sq., 6, xxii 27, 48, 50sq., xxiii 9, xxv 33, 64, xxvi 7, 25 to 27, xxvii 2sq., 13, 18, 21, xxix 29, 32, 87, 89, xxxii 24, xxxiv 9sq., 15sq., 34, 39, 50
imageless thoughts xxvii 3, 7sq., 10, xxviii 2sq., 5, 7, xxxiv 13
imitation iv 7, vii 10, 17sq., 21, 30, xv 11, xviii 9sq., xxii 43, xxv 33, 68
impulse iii 1, 15, 19, 33sq., vii 42, xvii 4sq., xviii 7, xxi 14, xxii 27, xxv 18, 20sq., 55, xxxi 2, 5, xxxii 11, xxxiii 4, 6
impression xxvi 9, 13, 18 to 26, 29sq., xxvii 1, xxviii 2, 4, 6, xxxiv 3, 15
inadequacy xxii 25, 43, xxv 30, 38
incarnation xxviii 11
indeterminacy, -ism vii 8, viii 3, x 3, 12, xi 11, xiv 31, 45, xix 2, 10, 34sq., xxi
indifference xix 2, xxi 24
individual, -ity, individuation ix 23, x 6, 11, 16, xiv 17, xix 30, 33sq., xxi 8, 19, 23, xxiii 2sq., 5, xxiv 1, 4, xxv, xxvi 1, 3, 8, 16, 23, xxviii 2, 11sq., 16, xxix 16, 18, 27, 85, 108, xxx 4, 10 to 12, 15, 17, 19, 22, xxxi, xxxiii 9sq., 16, xxxiv 3, 9, 18, 40, 48
Individualism xii 3
Individual Psychology xxv 5, 21, xxxi, xxxiii 8, xxxiv 51
infant, infancy (see 'childhood')
inferiority vi 34, x 13, xxv 28, 33, 35, 38, 41, 46, 59 to 63, 67, 69, 80, xxxi 2 to 5, 8sq., xxxiv 44

inheritance viii 11, 16, xxx 15 to 17, xxxiii 3, 10
inhibition xxii 12, 28sq., 46, 51, xxix 7, 11, 14
innate ideas xxvii 10
insecurity vi 23, xxv 35, 38
insight vii 20, xxxii 11sq., 24
instinct, -ive, -ual i 35, iii 65, vii, x 32, xi 34, xii 67, xviii 3, 6, 9, xxi 4, xxii 26, 48, xxv 11, 18, 20sq., xxix 21, 25 to 36, 41, 45 to 47, 53 to 55, 61 to 64, 99 to 102, 104, xxx 15sq., 19sq., 22, xxxii 3, 17, 19, xxxiii 3, 5 to 11, 13, 15, 17, xxxiv 18, 28, 46, 51
intellect, -ion, -ual vi 20, 55, 58, xiv 19sq., 50, xix 4, 29, xxi 4, xxviii 16, xxxiii 3, 15
intelligence iii 66, x 9, xiii, xxiv 11
intelligence tests x 8, xxvi 15, xxvii 3
intelligible, -bility viii 17, ix 7, xi 10, 18, xiv, xv 1, xix 19sq., xx 13, xxi 18
intention (see 'purpose')
interest v 30, vi 31, xi 26, xii 76, xv 8, xxvii 2, 15, 18, xxix 61, xxx 10, xxxii 11
'internal' behaviour xxxiv 17
interpretation vii 29, viii 7, 12, 16, 24sq., x 14, 21, xiii 17, xiv 7, xv 1, 7sq., 10, 12, xvi 5sq., xix 3, xxi 29, xxii 25, xxiv 2, xxv 57, 60, xxvi 1, 8, 13, xxvii 1, xxviii 16, xxix 10, 24, 55, 57 to 59, 77sq., 110, 113, xxx 9, xxxiv 45
introspection iv 11, viii 13, x 5, xii 18, xxi 29, xxvi, xxvii, xxviii 2sq., 4, 6, 9, xxxii 18, xxxiii 2, xxxiv 1 to 3, 6, 9 to 16, 20, 26, 29sq., 32, 44, 50sq.
introvert xxviii 9sq., xxx 10, 13, 22
intuition xxi 1, xxx 13, 22
inversion xxii 14
involuntary action vii 41, xxv 4, 18
Inward Will xxiv 20
irregularities xxxii 8, 22
isolates, isolation x 18, xi 7, 11, 15, xii 4, xiv 31sq., 36, 47, xvi 7, 10, 14 to 19, xviii 3, xix 10, 16, 24, 34, xxi 2sq., 8, 12, xxii 46, xxv 78

JACKSON xxix 12
JAMES xii 68, xxii 40, xxxiv 9, 26, 28
JANET xxii 25, 36, 40, 43, 46, xxix 7
jealousy vi 35, xvii 5, xxv 79, xxvi 1
JEANS xxi 1, xxiv 13, xxix 66, 98
JOAD xxi 3, xxxiii 17
joie de vivre i 38, vi 54
JONSON, Ben xii 59
judgment vi 55, vii 51, xii 6sq., 10, xiv 42, xvi 8, xvii 7, xix 24, xxiii 10, xxvi 1, 9, 30, xxvii 4, 20, xxviii 2, xxix 98
JUNG viii 13, xxviii 9sq., xxx, xxxi 1, xxxiii 11

KALCKAR ii 24
KANT vi 60, xii 67, xxvii 10
KARFT-EBING xxii 47
KARPECHENCKO ii 14
KELVIN xxi 16
KEPLER ix 15
KIERKEGAARD xxvii 10 to 13, 16, 18
kinesthetic impulses xxxiv 16
knowledge v 8, vii 48, viii 7, 11, 16, ix 37, xi 6, 17, xiv 3sq., 15, 32, 35, 46, xv 5, xvi 5, 10, xvii 8, xix 3, xx 3, xxi 6, 12, 15, 17, 21, xxiii 10, xxiv 16, xxv 2, 14, 24, 27, 30, 33sq., 40sq., 49, 83, xxvi 9, 12, 17, xxviii 9sq., xxx 14sq., xxxii 6, 12, xxxiv 9, 11
KOFFKA xxxii 1, 12
KOHLER xxxii 1, 11
KULPE xxvii 4sq., 9, 12, 18, xxviii 2, 5, 7, xxxiv 3

LADD xxxiv 9
language viii 19, xi 14, xiii 8, 18, xxi 7, xxv 30, xxviii 4, 6, xxix 91, xxxiii 10, xxxiv 32
LASHLEY iii 39, 48
LAVOISIER ix 16
laws iii 52, x 28, xi 13, xii 21, xiv 46, xvi 5, 11sq., 18, 20, xviii 7, xix 24, 29, 33, xxi 1, 9, 12, 15sq., xxv 9, 24, 32, 57, 69, xxvii 13, 18, xxix 1, 20, 42, 89, 106sq., 109, 111, xxx 19, xxxiv 1sq., 9
layers (of the mind) xxix 21, 60 to 62
learning iii 38sq., 45sq., iv 7, vii, viii 11, xiii 11, xviii 9sq., xxiii 9, xxv 51, 63, xxvi 4, 6, 30, xxvii 1, xxxii 11sq., 14, xxxiii 1, 6, xxxiv 3, 18, 21, 23, 27
LEIBNIZ vi 61
Leonie xxii 24
lethargy xxii 3, 7, 10, 24
LEVY viii 27, x 22, xii 71, xiv 14, xvi 17, xix 33sq., xxi 17, xxix 98
LEWIN xxxii 15
liberty xxi 18, 24sq.
libido xxix 33, 41, 47sq., 64, 102 to 104, xxx 3 to 7, 10sq., 22, xxxi 2 to 4
LIEBAULT xxii 6
lies x 29, 31, xi 15, xv 5, 7sq., 14
LIEJOIE xxii 23
life, living i 2, iii 8, 54, 66sq., vi 16, vii 48, viii 9, ix 2, 26, x 7, 9, xi 30, xii 5, 29, xxi 14, xxv 11, 13, 40, 49sq., 53, 62sq., 64, 67, 77 to 80, 86, xxvi 17, 30sq., xxvii 22, xxviii 11sq., 14 to 16, 18, xxix 6, 26, 58sq., 62, 91, 107, xxx 9, 13, 15sq., 17, 22, xxxi 3 to 8, 12, xxxiii 5, 9, 16, xxxiv 6, 9, 51
localisation iii 37, iv 13, 18, xxix 86
LOCKE xii 63
logic, -al xi 15, xix 8, xxvii 10, xxix 69, xxx 21

longing vi 14, xxix 26 to 34, 102, xxx 9
love vi 42, 46, xvii 5, xxii 49, xxiii 11, xxiv 10 to 12, xxv 14, 51, 68, 73, 76 to 78, xxviii 11sq., xxix 8, 11, 64, xxx 10, xxxi 5, xxxiv 27
lunatics xxii 16, 47, 51
LYSENKO ii 19

MASS xii 26, 31, 33
MACAULLY xii 59
maladjustment xxxi 3
male xxx 21sq.
MALEBRANCHE xii 64
main-period xxvii 7, 16, 18
man i 38, vii 18sq., 22, 50, viii, ix, x, xi 32, xvi 8, xviii, xix, xx, xxi, xxiii, xxv 11, 21, 49sq., 53, 57, 69, 86, xxvi 3, xxvii 11, xxviii 16, xxix 25, 45, 62sq., xxx 19sq., 22, xxxi 12, xxxii 24, xxxiii 1, 13, 16, xxxiv 6, 38, 51sq.
mania xxii 14
MARBE xxvii 4, 7, xxviii 2
MARCONI ix 18
MARX, -ism xxviii 18
mass-action iii 39, 41sq.
Materialism, -ist iv 12, vii 51, x 10, xix 33, xxi 3, 6, 15, xxii 46, xxiii 4, xxvii 10, xxix 2, 96, 100, xxxii 24, xxxiii 12, xxxiv 49
matter, material i 6, iii 20, xi 6, 32, xii 2, xxi 1, 6, 8sq., 13, 18, 21, 27, xxiii 2sq., xxv 39, 77, 82, xxix 1, 30, 97, xxxiii 13, 16
MAXWELL ix 18, xxi 16
Mathematics x 6sq., xiii 7, xiv 20, 46, xvi 15, xix 24, 34, xxi 12, xxiv 6, xxvi 18, xxvii 1, 13, 18, 22, xxix 68
maya xiv 4
MCDOUGALL vii 53, xxxiii, xxxiv 6
means xviii 10, xix 19, 35, xxiv 6, xxv 18, 36, 67
mechanism, -istic, -ical x 8, xxi 10sq., 16, 28, xxix 31, 86 to 88, xxxii 11, xxxiii 13, xxxiv 9, 26
memory i 37, iii 6, 62, iv 17, v 2, 8, 21, vi 53sq., 55, vii 14, 33sq., viii 5, x 18, xii, xvii 10sq., xviii 9, xix 2, 26, 29, xxi 6, xxii 26, 38, 40sq., xxiii 8, 11, xxiv 3, 8, xxvi 4, 6, 17, 26, xxvii 1, 18, xxviii 2, xxix 7, 9, 11, 21 to 24, 87, xxxi 12, xxxii 11, xxxiii 1, xxxiv 2sq., 16, 24sq., 29, 39, 50
MESMER, -ism xxii 1, 24, 29, xxix 1
MENDEL i 42, ii 9
MENDELLSCHN xxv 59
MEYER xxxiv 9
milieu theory xxv 87
MILL, J. S. xii 58, 66
MILL, James xii 65
Mind, mental vii 61, viii 21, 30, x 8, xi 9, 11, 14, 25, xii, xv 5, xvi 4, xix 1, 7, 19, xx 1sq., xxi 2 to 7, 12, 14, 16, 19, 21, xxii

19, 46, 50, xxiii 3, 11sq., xxiv, xxv 7, 33, 39, xxvi 17, 25, 27, xxvii 10, 15, xxix 1sq., 25, 30, 32, 46, 51, 61, 63, 77sq., 84 to 87, 91sq., 94, 97, 102, 110sq., 113, xxx 19, 22, xxxiii 3, 15, 17, xxxiv 1, 5, 10
minderwertigkeitsgchul xxv 38
molecules xix 33, xxi 8, xxxiv 37
MOLL xxii 19
Monism vii 51, xxix 96, 100
monkeys xiii 12, 15sq., xv 9, 11, xxii 22, 24
monotony xxii 24, 27, 30
moral, -ity xxv 16sq., 49, 51 to 53, 86, xxix 62, 71, 113, xxx 4, xxxiii 15, xxxiv 39, 44
MORSELLI xxii 21
motive (see 'purpose')
motorium xxxii 9
motus ab intrinseco i 7, xxi 18
movement, motion i 7, 17, ii 27, iii 19, 22, 33, iv, v 6, 17, 16, xvii 1, xviii 7sq., 10, 14, xxiv 10, 20, xxv 11, 18, 39, 55, 57, xxxii 1, 9, 21, xxxiv 17, 27, 29sq., 35 to 37, 47
MOUNIER xxviii 15 to 18
MOZART xii 59
MULLER ii 17, 23, xxvi 28, xxvii 1, 7, xxviii 3, xxxiv 3
MUNTHE xv 9sq., xxii 14 to 19, 21 to 24, 27, 47 to 50
muscle, muscular system ii 29, iii 3, 7sq., 19, 23, 30, iv 5, 16, v 15, 17sq., 23, vii 38, xii 29, xiii 11, xviii 4sq., xxi 6, xxii 2, 12, 30, 51, xxv 63, xxvi 24, 26, xxvii 5, 10, xxxii 8, xxxiv 16, 24, 26, 37
music v 19sq., xxvi 17, 21, 32, xxxi 12
mutation i 5, ii 11sq., 22sq., 40, xxiii 2, 9
mysticism xxviii 11, xxx 9
mythology xxix 113, xxx 17

NAPOLEON xxv 59
nature xi 14, 25, 34, xiv 48, xv 1, xx 3, 11, xxi 12 to 16, xxiii 2, xxiv 16, xxv 5, 9, 11, 17, 20, 22, 33, 46, 51sq., 69sq., xxvii 22, xxix 77, 112, 114, xxx 19sq., 21, xxxi 3, xxxiii 13
necessity xxi 21, 25
needs x 10, xi 26, xix 5, 13, xxi 17, xxiii 8, xxv 81, xxxii 7, xxxv 9
negative-after-image (see 'after-image')
neighbour xxx 76, 78
NELSON xv 12
nerves, nervous, neural ii 29, iii 3, 5, 12sq., 19, 30, 49, iv 16, xii 29, xix 36, xxii 27sq., 46, 51, xxvi 26, xxix 4, 6, 84, xxxiv 1, 9, 16, 26, 38
neuron xxii 27, 46
neurosis, -tic iii 65, ix 22, x 21, xv 12, xxii 1, 14, 16, 25, xxv 44, xxix 4sq., 12, 40, 52, 77sq., 114, xxx 3sq., 8, 10, 16sq, xxxi 2, 4, 6

NEWTON, -ian xix 29, xx 8, xxi 16, xxx 21, xxxiii 11
NIETZSCHE xxiv 21, xxv 16, xxix 12, 23, 42, xxx 21
nirvana xiv 4
No xxx 22
Non-Ego xxiv, xxv 7sq., 51
Non-Self xii 1, 3sq., xxiii 8, xxiv, xxv 7sq., 11, 34, 87, xxviii 9, 16
normal, -ity xix 33, xxiii 12, xxix 25, 44, 52, 77sq., xxx 16, xxxiv 28, 41
NOSTRUM xxii 50
notion xi 7, 10, 12, xiv 46, xv 2, xix 18, 29, xxiii 8sq., 11, xxiv 1sq., 4, 9, 13, xxv 33, 40, xxix 62
nucleus i 16, ii 2, 25
number xiii 7, xxi 9, xxvii 1sq., 13, 15, 18
NUTT xii 75 to 79

object of desire vi 17, xxix 41sq., 47 to 49, 54, 61, 102sq., xxx 6sq., 10, 21, xxxiii 4, 6sq., xxxiv 16
objective, -ity vi 47sq., viii 6sq., 13, 23sq., 31, x 14, xi 15, 19, 21, xii 1, 8, xiv 5sq., 47, xv 7, 12sq., xvi, xvii 4, 7sq., xix 3, 5sq., xxi 6sq., 9, 29, xxiii 8, xxiv 3, 8sq., 13 to 15, 18, xxv 18, 40, 52, 60, 67 to 69, 74, 77, xxvi 1, 3 to 18, 22, 29, xxvii 19, 22sq., xxviii 2 to 6, 9, 16, xxix 110, 113, xxxi 8, 13, xxxiv 4, 6, 10sq., 13, 15sq., 20, 30, 44, 46
oblivescence curves xxvii 1
obsession xviii 16sq., xxii 25, 51, xxiv 7
oedipus-complex xxix 14, xxx 4
OGDEN viii 26, xxix 66
omnipotence, omniscience xxi 16, 18, 21, xxv 75
one, -ness xvi 1sq., 5, 13, 16, 19, xix 4, xxxiv 14, xxix 91, xxxi 13, xxxii 23
ontogenesis ii 30, xxix 106
opposites, opposition xi 6, xxvii 6, xxix 23, 64, xxx 21sq., xxxi 9, 11
order i 46, xi 6, 9, xii 44, xiv 3sq., 6, 17sq., xix 19, xxi 18
organic sensations v 13, xxvi 16, xxxiii 12
organization xxxii 1, 20, 22sq., xxxiv 25
organism xxx 15, xxxii 9, 21, xxxiii 5, 12, xxxiv 9, 24, 29, 47
oscillatory movements xii 30, xxv 55
outlet xxix 11, 14, 30, xxx 5
over-compensation xxv 54, 56, 66, xxxi 2, 15

pain iii 19, iv 5, v 6, 18, 20, 27sq., vi, vii 16, 44, 47, viii 17, xi 26, xvii 5, xviii 7, 9, xix 5, xxii 11, xxv 18, 53, xxvi 18
Parallelism xxi 3
part and whole xii 70, 81, xiv 22, xix 33, xxi 23, xxiv 5, xxvii 6, xxxii 4sq., 24, xxxiii 13
PASCAL xii 59, 64
passion xi 28sq., xix 28, xx 14, xxii 41, xxv 55, xxvi 1

past xxviii 11, 17, xxix 17, 85, xxx 4, 19, xxxi 7
PASTEUR ix 19, xvi 18
pattern xii 71, xxx 6, xxxii 2, 4, 11, 14, xxxi 11, xxxiv 26sq., 50
PAVLOV iii 43, 45, xxii 28 to 31, 46, xxxiv 20
Pelmanism xii 74
percept, -ion iv 17, v 5, 31, vi 20, xi 10 to 12, xii 10, xiv 1, 26sq., 42, xvi 1, 7, 15, xvii 7sq., xix 37, xxi 21, xxiii 3, xxiv 1sq., 6, 18, xxv 8, 24, xxxiii 4, 6, 15, xxxiv 9, 24, 51
performance xxvii 4sq., xxviii 2, 6, xxxiv 3 to 5, 8sq.
permanence xiv 14sq., xvi 2, 4sq., 9, xxiv 10sq., 14
perplexity vi 26, 32, xi 26, xiv 4sq., 21, 23, xix 15, xx 13, xxxi 13
person, -al, -ality i 37, iii 51, xiv 14, xxi 28, xxii 32, 36, 41, 48, xxiii, xxv 36, 49, 51, 53, 69, 77sq., 82 to 84, 87, xxvi 3, 9, 15, xxviii 6, 16, xxix 26, 44, 63, 85, 113sq., xxx 4, 14, 16, 22, xxxi 14, xxxii 20, xxxiii 7, xxxiv 51
persona xxx 17
perturbation v 5, vi 26, xi 26, 30, xiv 21, xv 15, xxiii 11, xxiv 3
phantasy xii 13sq., xxv 64, 67, 69, xxix 11, xxx 4, xxxi 4
phobia xxii 25, 51, xxiv 7
phrenology iii 37
Philosophy ix, xiv 33, xxi 16, 30, xxiii 4, 6, xxviii 11, 14, 16, 18, xxix 68sq., 83sq., 98, 113, xxxii 24, xxxiii 13, 16, xxxiv 37, 42
photo-synthesis xi 23, xxv 11
phylogenesis xxix 109
Physics xiv 20, xix 29, xxi 17, xxvi 13, 21, xxviii 1, 6, xxix 67sq., 77, 89, 92, 98, xxx 5, 21, xxxiii 13sq., xxxiv 48
Physiology, -ical x 9, xxvi 18, 26, xxix 6, 85sq., 89, 92, xxxii 21, 24, xxxiv 1, 9, 24, 26, 47sq.
pictures xxix 66, 68, 73, 89sq., 98
PILLSBURY xxxiv 7, 11
pituitrin iii 18
plan, -ning i 38, ii 28, iii 6, 20, 66, v 19, viii 3sq., 9sq., 17, 29 to 31, xi 8, 31, 34, xii 4, 6, 10, 29sq., 47, 81, xiv 6sq., 12sq., 15, 22, 24, 29sq., 39sq., 51, xv 15, xvi 1sq., 5, xviii 10, xix 5, 15, 19, 22, 33, xx 12sq., xxiii 2sq., 10, 12, xxiv 1sq., 8, xxv 9, xxvi 26, xxvii 18, 20 to 22, xxxii 24, xxxiv 36, 51
plant i 13, x 10, xix 10, 30, xx 8, xxi 11, xxxiii 13
PLATO vi 58, 60, viii 27, ix 6, 11, xiv 16, xix 7, xxix 63
PLATEAU xxxii 1
play vii 43, xvii 7, xxv 55, 63, 82
pleasure, pleasantness i 39 to 45, iv 3, v 6, 27sq., vi, vii 16, 43sq., viii 17, xi 26, xii 20, xvii 5, xviii 7, 9, xix 5, xxiv 11, xxv 18, 53, 55, 63, 82sq., xxvi 23, xxviii 10sq., xxix 25 to 29, 35, 113, xxx 5, xxxiv 16, 23, 26
Positivism, -ist viii 26, xvi 10
posture iii 4, v 19

potentiality xi 6, xix 26, xxi 9, xxv 33, 37, 63
power vi 55, xxiv 21, xxv 20, 48, 55, xxx 5, 16
prayer xxviii 12
predestination xxi 17
prediction xxi 12, 17
prejudice xxvi 8, xxvii 19, xxxiv 27
preparation xxvii 6sq., 11sq., 14sq., 16, 18
pressure xxi 12, 18, 25, xxii 11, xxvi 18, xxxiv 2
PRINCE xxii 36
Principle of Causality xii 72
„ „ Closing-the Gap xxxii 15
„ „ Emotional Disturbance xxxi 13
„ „ Pleasure xxix 26
„ „ Psychical Disturbance xiv 14sq.
„ „ Reality xxix 26, 38, 44
„ „ Trial and Error xii 69, xxxii 12
„ „ Teleological Causation xxxiii 16
probability xix 34, xxi 1, 9, 21
productive imagination xii 13
Progress viii 11, 14, xiv 35, xxv 16, 35
PROMETHEUS xxv 16
propaganda x 28sq., xxiv 4, xxxiv 40
properties xxx 21
psyche xxx 17, 22, xxxi 12
psychasthenia xxii 25
Psychiatry xxix, xxx, xxxi, xxxiv 40
Psycho-analysis xii 67, xiv 9, xix 26, xxii 23, xxix, xxx, xxxi, xxxiv 40, 51
psychogenesis xxix 109
Psychology, -gical, -gist ix, x, xxiii 14, xxviii 1, 6, 8, xxix 2, 4, 12, 68 to 71, 80, 98, xxx 12, 21, 14, xxxii 1, 4, 17, 23sq., xxxiii 1, 3, 10sq., 13, 16, xxxiv
psychophysische maasformal xxxiv 1
purpose, -ive (motive) vii 5, 27, 51, viii 8sq., 18, x 7, 22sq., xiv 3sq., 6sq., xv 12, xix 19sq., 33sq., xx 3, 13, xxiii 8, xxv 18, 20, 56, 81, xxvi 1, 8sq., xxvii 4, xxx 22, xxxii 7, 12, 24, xxxiii, xxxiv 36, 51
Purposivist (see 'Hormic Pschology')

quality of sensation v 1sq., xxvi 19, 21, xxxii 4
Quantum Theory ix 23, xi 11, xxi 17
questioning xxix 22
quiescence vi 32, xiv 4sq., xxi 7

race, human (see 'human race')
racial consciousness (see 'collective mind')
racialism xxiv 4

radar vii 34, ix 20
RADHAKRISHNAN xxi 10
RALEIGH xix 37
randomness xviii 7, xix 34
range of freedom xxi 19
rapport xxii 5, 26sq., 43, 46, 49
Rationalism xxviii 9, 11
rationality xxiii 4
reaction, reactivity, responses vi 2, 11, vii 17, 31, 35, 38, viii 9, xi, xiv 15sq., 49, xv 1sq., 7, xvi 17sq., xix 6, 11, xxi 8, 16, 19, xxii 26, 28, 35, 45sq., 48, xxiii 8, xxiv 1, 9, 13, 18, xxv 7sq., 10, 18, 87, xxvi 3sq., 6, 13, 15, xxvii 5, 7, xxix 102, xxx 6, xxxii 24, xxxiii 13, xxxiv 1, 3, 15sq., 20, 25, 32, 45, 47
real, -ism, -ity ix 7, xi 14sq., xii 1, xiv 1, 34, 39sq., 46sq., xv 1, 5, xvi, xvii 1, 9, xix 12, 14, 34, xx, 11, xxi 12, 18sq., 27, xxii 43, xxiii 2, 7, 10, xxv 12, 62, 64, 67sq., 69, xxviii 4, 10sq., 15sq., xxix 26, 38, 44, 103, xxx 4, 20, xxxi 4, xxxiv 34, 50
reason, -ing v 8, vi 55, vii 14, 25sq., viii 29sq., xi 34, xii 52, xiii 12sq., xvii 4, xviii 9, xix 28sq., xxi 7, 19, 21, xxii 41, 51, xxiii 10, xxv 68, 77, xxx 22, xxxiii 2, 12
receptors iii 3
eceptivity xx 6
eciprocity xxv 39
recessive characters ii 9, 22
recognition iv 17sq., v 31, vi 22, xii 16, 52, xxv 84
recollection (see 'remembering')
Redemption xxiii 6
reflex iii 33sq., 44sq., 53, 65, iv 9sq., 14sq., 18sq., v 2, vii 38sq., xii 68, xviii 9, 12sq., xix 36, xxii 28sq., 46, 51, xxiii 13, xxv 4, 18, 21, xxix 29, 85 to 89, 99sq., xxxii 3, 17, 19, xxxiii 1, 5 xxxiv 20 to 22, 27, 41, 44
Reflexology, -gist iii 44sq., iv 19, vii 19, 23, x 28sq., xxxiv 37
regression xxix 14, xxx 4
relations v 8, x 1, xi 2, 13sq., xii 4, 9sq., 19, 47sq., xiv 15, 29, 46sq., 48 to 51, xvi 7, 15, 18, xvii 2, xix 5, 8, 11, 13, 15, 19sq., 26, 35, xx 13, xxi 12, 16, 27, xxiii 2, 8sq., xxiv 1 to 5, 9, 11 to 16, 18, xxv 7 to 9, 12, 18, 20sq., 26sq., 33sq., 36, 38sq., 52, 74, 76sq., 82, 87, xxvi 27, xxvii 1sq., 6, 10, 18, 20 to 22, xxviii 1, 11, xxix 32, 58, 77, 85, 98, 103, 111, xxxi 5, xxxii 24, xxxiv 1, 36
Relativity xix 29
relaxation xxix 9sq.
religion xxviii 10, xxix 9, 13, 15, 80, xxxiv 40
remembering, recollecting xii 19sq., xix 9, xxii 11, xxiii 11, xxvi 24
remorse xx 12, 14
repetition xii 33sq., 43, 51, 76, xviii 7sq., 11, 13, 16sq., xix 13, xxiv 6, xxv 18
representation (instinctual) xxvi 27, xxix 29sq., 32, 34, 41, 102

repression xxix 7, 9, 22sq., 30, 50, 89, 97, 111, xxx 4, 10, 14, 19, xxxi 7, 9. xxxii 12
reproduction i 19sq , 25sq., 31sq., ii 8sq., 17, 25sq., xxv 11, xxx 5, 16
reproductive imagination xii 13sq., 56
res in se xxvii 22
research xvi 20, xxv 34, xxvi 9
resistance vi 60, xxii 20, xxv 29, xxix 19, 24, 76sq., xxxi 9, xxxiv 1
response xxii 29, xxv 11, 87, xxvii 4sq., 7, 10sq., 12, 16, 21, xxxii 1, 9, 12, 14, 21, xxxiii 5, xxxiv 11, 15 to 18, 22, 24 to 27, 29sq., 36
responsibility xviii 1, 17, xix 28, xx, xxi 17, 29, xxiii 6, xxv 2, 43, 50, 52, 61, 72, xxix 113, xxxiv 44
resultant vi 49, 52, xxix 104
Resurrection xxiii 6
restrictions x 10, xix 3sq., 21, 28, 30 to 32, xxi 19, 21, xxv 16, 23, 25, 46, 64, xxviii 4
retrospection xxvi 1, xxxiii 2, xxxiv 2
reverie xvii, xviii 14
RIBOT xxix 12
RICHARDS viii 26
rights xx 7sq., 11
RIVERS xxii 26, 45
robot iii 66, xvi 3
ROOSEVELT xxv 59
RUTHERFORD xxvii 22

saints xx 10, xxi 6, xxiii 6
Sally the Chimpanzee xiii 7, 10
satisfaction iv 3sq., vi 32, 51, 53sq., vii 43sq., xi 26, 31, xii 39, xx 5, xxv 18, 55, 64, 82sq., xxix 29, 35, 37 to 39, 45, xxxiii 15
SATRE xxviii 15 to 18
SCALIGER xii 59
SCHMALHAUSEN ii 20
SCHOPENHAUER vi 60, xi 55, xxx 5, 20sq.
Scholastics, Schoolmen ix 11, xii 45, 61sq., xix 29, xxi 4, xxiii 2, 4
Science, Cause and God xii 71, xxix 69, 98
science, scientific, scientists viii 26sq., ix, x 2, 6, xi 3, 7, 9, 12sq., xiv 2, 15, 33, 46, xvi, xviii 1, xix 24, 29, xx 1, xxi 6sq., 10, 16sq., 30, xxii 24, xxiii 1, xxiv 13, 16, xxv 9, 13, 16, xxvi 9, 13sq., 17sq., 30, xxvii 22sq., xxviii 2, 9, xxix 68, 79, 83, 91, 94, 108, 113, xxx 21sq., xxxiii 13, xxxiv 6, 9 to 11, 36sq., 40sq., 43
SCOTUS xxi 4
security vi 23, 25, xxv 32sq., 41
seeing, sight, vision iii 19, v 2, 23sq., vi 52sq., xi 20, xvii 1, xxvi 9, 12sq., 20, 26, xxvii 14, xxxii 1, 6sq., 9, 22, xxxiv 2, 29

selection, -tive, -tivity i 28, ii 12sq., 26, 29, vii 25, x 25sq., xi 22sq., xiv 28sq., 49, xv 5, xviii 5, xxii 46, 50, xxix 102, xxxiii 4
Self vi 1, 30, 33, 35, 42sq., viii 4, 12, x 13, 18, xi 9 to 11, xii 1, 3sq., xiv 29, xix 5, 10 to 13, 18sq., 26, xx 11, xxi 29, xxii 41, xxiii 2, 7sq., 11, xxiv, xxv 7, 11, 34, 36sq., 40, 49, 51, 69sq., 77, 81sq., 87, xxviii 9, 12, xxx 10, xxxi 13, xxxii 24
self-assertion xxv 49, 55sq., 58, xxxiii 8
self-conservation, preservation vii 44, xviii 7sq., xxv 11, 49, 55
self-control xxxiii 8
self-regard xxxiii 8
self-respect vi 33, x 13, xx 11, xxv 38, 83
sense, sensation, sense-organ, sense-species, sensory ii 27, iii 1sq., 19, 32sq., 42, 51, iv 3sq., v, vi 8sq., 58, vii 51, xi 9, xii 1, 10, 12, 67, xvii 1, 3 to 8, xviii 15, xix 1, 4, xxi 4sq., 6, 18, xxii 44, 46, 51, xxiii 11, xxv 21, 38, 48, 63, 67, xxvi 9, 12, 16 to 26, xxiv, xxviii 1, 3sq., 5, xxix 100, 102, xxx 13, 22, xxxi 12, xxxii 1, 3, 6, 17, 21, 24, xxxiii 1, xxxiv 1, 8, 15sq., 24, 26, 29sq., 37, 39, 46
sensibles xii 10
Sensist xxviii 4
sensitivity, sensibility xiii 5sq., xxii 12, 26sq., 35, 46, 49, 51
sensorium xxxii 9
set, setting ii 4, v 30, xii 20, 47, xvii 5, xviii 5, xxvi 25 to 28, xxvii 1, 5, 7, 21, xxxiii 12, xxxiv 26
sex, -ual i 31, ii 8, iii 18, iv 3sq., vi 4, vii 2, 32, 48, xi 34, xix 5, xxii 14, 48, xxv 32, 43, 55, 72, 85, xxix 6, 14, 33, 41, 103 113, xxx 4 to 7, 10, 16, 22, xxxi 2, 5, xxxiii 12 xxxiv 16
'shadow' xxx 17
shame vi 36, xx 14, xxix 7
sight (see 'seeing')
signification, significance iii 66, v 31, vi 43, viii 17, xi 4, 6, 8sq., 14, xiv 2sq., 17sq., 51, xv 7, xviii 2, xix 20, xx 1sq., 4, 13, xxi 18, xxii 51, xxiii 10, xxv 10, 14, 18, 20, 36sq., 39, 51sq., 61, 69, 77, xxvi 3, 9, xxvii 1, 6, 19, xxviii 3, 6, xxix 10, 70sq., 77, 98, xxx 9, xxxiii 3, 13, 16
similarity vii 23, xii 19sq., 29, xiv 12sq., 15sq., 23, 40, 48, xviii 8, xxv 9, xxvi 22, xxvii 6, xxix 109
simple ideas xiv 25, 38sq., 44sq., 47, xix 24
situation xxxii 7, 13, 22, 24, xxxiii 5, 7, 9, 15, xxxiv 20, 26sq.
sleep xxii 3sq., 6sq., 19, 24, 27sq., 30, 43, 45sq.
smallness xxv 27sq., 59
smell, -ing v 11, xii 10, xxvi 9, 22, 26, xxxiv 29
SMITH ix 17, xxxiv 21
society, social vi 37, viii 6sq., 10, 12, 15, 24sq., 27, ix 24, xvi 1sq., 4sq., xix 21, 31, 33sq., xx 7, 9sq., 12, xxi 8, xxiv 4sq., xxv 2, 10, 13, 16, 21, 24, 43, 48sq., 52sq., 69 to 83, xxvii 20, xxviii 6, xxix 9, 15, 26, 62, 80, 104, xxxi 4sq., xxxiii 1, 9sq. 16, xxxiv 48

Sociology x 1, xx 10, xxx 19, xxxiii 1, 10, 16, xxxiv 40, 48
SOCRATES xxviii 9
somnambulism xxii 3, 7, 11
soul iii 25, 34, iv 11, 15, v 7, xii 45, 50, xix 7, 24, 27, 29, xxi 27, xxii 19, xxiii 3, xxv 2, 21, 39, xxviii 10, xxix 114, xxxiv 1, 5, 14
sound v 19, xii 10, xxvi 12, 18, 21, 26, xxvii 1sq., 18, xxxiv 27
Solipsism viii 31, xi 15sq., xxix 96, 103
space-time xii 9, xxi 16, xxiii 3, xxvii 20
specialization i 34, 38, ii 2
species, specific v 7, xi 12, 22sq., xii 45, xiv 13, 28, 45, xxi 18, xxv 9, xxviii 16, xxix 109
speech iv 14, 17, v 21sq., vii 28, viii 8, 18 to 31, xi 15, xii 4, xiii 21, xiv 14sq., xv 3, xix 26, xxv 3, 13, 21, 49, xxii 21, xxvii 10, xxix 67sq., xxx 16, xxxiv 17, 25, 29 to 32, 36sq.
SPENCER vi 61, xii 26, 51
spinal-cord iii 12sq., xix 36
SPINOZA vi 60, xxv 11
spirit, -ual iii 20, xi 32, xii 3, xiv 15, 17, xix 7, 25, 27, xx 1, 3, xxi 6sq., 12, 18, 27, xxv 2, 5, 21, xxvii 8, 10, 19, xxviii 12sq., 16, xxx 16
Spiritualistic School xii 50
SPRENGEL i 40
statistics x 11sq., xix 33sq., xxi 1, 9
STEKEL xxx 1, xxxi 1
ST. FRANCIS xxii 48
stimulus iii 14, 16, 33, iv 8sq., 13, 16sq., v 2, 10, 19, 24sq., 30, vi 2sq., 12, 54, 58, vii 6, 23, 38, 44, 47, xii 69, xvii 4, xix 1, 36, xxi 16, 19, xxii 28 to 30, 45, 51, xxv 11, 16, 55sq., 58, xxvi 18 to 20, xxvii 5 to 8, 10, 12, 15, 21, xxviii 2, xxxii 1, 7, 9, 14, 21, xxxiii 3, 5sq., 12, xxxiv 1sq., 11, 15sq., 27, 48
strata mental (see ' layers ')
strangeness vi 22, 24, xix 13, xxv 27, 31, 48
striving xxx 17, xxxi 5, xxxii 2, 8, 15sq.
structure (of the mind) vii 35, viii 2, xxi 8sq., xxvii 22, xxix 78, xxxiv 5, 9
ST. THOMAS xii 10, 61
STUMPE xxxiv 9
subconscious xxix 14, 21
Subjectivism xi 15sq., 21, xii 1, xxi 6, xxviii 9, 16, xxix 103, 113
subject, -ive, -tivity viii 6 sq., 17, 23, xi 15, xv 12, 15, xvi, xvii 4, xix 5sq., 21, xxv 1, 18, 23, 41, 53, 60, 62, 69, 75, 84, xxvi 1sq., 8, 11sq., xxviii 16, xxix 102, 113
sublimation xxix 11, 14, 30, 42, 43, 49, 103
substance xxiii 2sq., 4, 10, xxiv 3, xxix 69
substantial form (see 'form')
substitute xxix 8, xxxiv 34sq.
success xviii 8sq.

suggestion, -tibility xiv 42, xvii 3, 7, xxii 5, 11sq., 13, 17, 19 24 to 26, 27, 31, 35, 43, 46 to 48, 50sq., xxiii 9
SULLY xii 66
Super-Ego xxix 62sq.
superiority vi 33, xxxi 2 to 8, 10, xxxiii 8
supernatural xx 11sq., xxiii 6, xxv 21, xxxi 13
superstition x 29, xvi 20, xix 31
suppression xxii 12
supreme form xi 2, 4
susceptibility xxi 9, xxii, 5, 11sq., 27, 50, xxv 39
symbol, -ic, -ism xxix 10, 49, 51 to 55, 59, 70sq., 77, 102, 110sq., xxx 16, xxxiv 34
sympathy vi 30, viii 3, 17, 25, x 13, xvi 5, xx 13, xxii 26, 48, xxiv 11, xxv 84, xxvi 32
synthesis viii 24, x 1, xi 7, xii 9, xiv, xv 7, 15, xvi 8, 15 sq., xix 24, xxvii 20, xxviii 6, xxx 4

taste, tasting iii 58, v 10, vi 52sq., xii 10, xxvi 9, 19, 26, xxxiv 29
telepathy xxii 32sq.
teleology, -gical xxxiii 13
temperature, sense of v 14, xii 10, xxxiv 2
tendencies xi 14, xvi 19, xviii 11, xix 33, xxi 6, xxiv 1, 5, 21, xxv 11sq., 16, 22, 25, 49, 57sq., 68, xxix 23sq., 51, 104, 111, xxx 4, 16sq., xxxii 7sq., 22, 24, xxxiii 3, 8, 10, 12, xxxiv 28
tension xxii 2, 25, 46, xxix 6, 35, 37, 89, 94, xxxii 7, xxxiv 37
tests xxvi 15, xxxiv 3
Theology xxviii 10sq., 18
theory xi 14, xvi 5, 11sq., xx 8, xxi 17, xxii 1, 24, 42, xxiii 1, 14, xxv 39, 87, xxvii 10, xxix 61, 75, 77sq., 80, 86, 89sq., 93, 112, xxx 6, xxxii 14, xxxiv 1, 30, 36sq.
therapy xxix 78
THOMSON iii 57
THORNDIKE iii 38, viii 15sq., xii 70, xxxii 11sq., xxxiv 3, 12, 23, 28
thought, thinking vii 26, viii 7, 21, 25, 27sq., xii 81, xix 9, xxi 18, xxii 27, 33sq., 44sq., xxiii 9, 12, xxiv 11, xxv 21, xxvi 1, 3, 22, xxvii 3sq., 7sq., 10, 13, 18, 21, xxviii 2, 6, 10, 16, xxix 85, xxx 10, 13, 15sq., 22, xxxi 4, xvxii 17, 24, xxxiv 3, 9, 16, 24sq., 29 to 39, 46, 51
'threshold of consciousness' xxix 50, xxxiv 2
time v 17, xii 28, 43, xviii 2, xxii 11, 43, 50, xxvi 4, 6, 13, xxvii 1, 5, 15, xxviii 11
TITCHENER xxviii 3 to 7, xxxiv 3
TOSCANINI xii 77
totalitarianism xi 13, xxv 53
totality-finality xiv 2
touch, -ing, tactual iii 60, v 4, 12, 15, vi i, xxv 56, xxvi 26 xxxiv 2, 29

tradition xxviii 11, 15, 18
training xii 57, xx 8, xxv 2, 68, xxvi 9, 24, xxviii 3sq., xxix 13, xxxi 14, xxxiv 28, 41
trance xxii 3sq., 7, 29, 31, 50
transcendentals xiv 44
transference xxix 8, 11, 13sq., 41sq., xxxi 10
transformation xxx 4sq., 22
Transmigration xxiii 14
trauma xxix 60
traumdentung xxix 57
trial-and-error (see also Principle of, vii 11, 15sq., xii 69, xiii 14, xxxii 11sq., xxxiv 23
trieb xxix 101
triebschicksal xxix 85
true, truth vi 47, viii 30, xiv 27, 42 to 44, 47, xv, xxiii 11, xxiv 13, xxviii 9, xxix 80, 113, xxxii 23
TUCKER xii 63
TWITMYER iii 43
types xvi 16, xxv 6, 10, xxx 12sq., 22

ultimates xi 2, xii 72sq., xxi 9, 21
uncertainty vi 26, xxv 32sq.
unconscious, -ness vi 11, x 9, 16, xix 26, 29, xxii 25, xxv 33, 56, xxix 10sq., 13sq., 21, 52, 55 to 59, 62, 77, 89, 97, 109, 111, xxx 3sq., 13 to 22, xxxi 9, 11
understanding vi 32, xxii 49, 51, xxiv 16, xxv 84, xxvi 32, xxix 79
uniformity x 28, xxi 1, 16, xxvi 8
unification, union, unity vi 3, 16, 20, 22, 30sq., 38, 42 viii 3, 14, x 18, xi 4, 7, 10, 25, 34, xiv 6, 10, 18, 20sq., 40sq., xvi 1sq., 5, 15sq., 19, xix 1, 5, 7, 10sq., 14 to 20, 24, 29, xxi 6, 8, 18sq., 21, 23, 27, 36, 47, 49, xxiii 3, 5sq., 10, xxiv 1, 5, 9 to 11, 15, 20sq., xxv 5, 7, 11, 15, 21, 35, xxvi 16, xxxi 11, 13sq., xxxii 24, xxxiv 51
units xi 2, xii 69, xxv 39, xxix 84, 91sq., xxx 22, xxxii 1, 6, 9, 21, xxxiv 1
universals xiv 16, 38 to 51
urge iv 2sq., vi 3, 20, 42, vii 37sq., 43sq., 48sq., xii 46, xiv 11, xix 11, 15, xxiv 1, 11, 15sq., 20, xxv 7, 51, 55, 72, xxix 101, xxx 5, 22, xxxi 2, xxxii 7, xxxiii 2
'use' Freudian xxix 45

value iii 66, iv 1, vi 46, 47sq., vii 45sq., 48, xi 4, 6, 8sq., x 18, xiv 2sq., 6, 17, 39, 44, 51, xix 5, 7sq., 14, 19sq., 28, 36sq., xx 1sq., 4, 7, 11, xxi 7, 18sq , xxiii 6, xxv 14, 18, 20, 24, 36sq., 38sq., 51sq., 55, 61, 69, 77sq., 82 to 84, xxvi 15, xxviii 3, 6, xxix 78, 85, 113sq., xxxiii 15sq., xxxiv 39, 47
variations x 28, xviii 11, xix 7, 28, 33sq., xxi 19, xxiii 11sq., xxiv 4, xxv 55, 87, xxx 22, xxxiii 5sq.

VASILIEVSKY iii 49
VAVILOV ii 10sq.
VESALIUS ix 14
vision, visual (see 'seeing')
voice iii 63, viii 18
VOISIN xxii 24, 47
VOLTA ix 18
voluntary action vii 42, 45sq., xviii, xix 28, xxv 4, 18
volition (see 'willing')
vorlust xxix 38

waking xxii 29
WARD xii 26
WATERSON xxi 16
WATSON iii 42, vii 54, xxxiv 10 to 30, 36, 40 to 42, 50
WATT ix 16, xxvii 6sq.
weakness xxv 27, 29, 38, 41, 59, 61
WEBER xxxiv 1sq.
WEBER-FECHNER LAW v 20, xxxiv 2
WEININGER xxx 21sq.
WEISS xxxiv 48
WERNICKE iv 14
WERTHEIMER xxxii 1
whole, -ness viii 14, x 1, 16, xi 2, 25, xii 70, 81, xvi 16, xviii 2, xix 7, 20, xxi 6, 23, xxiii 5, xxiv 1, 5, 7, xxv 6, 19, 57, 86, xxvii 2, 6, 22, xxxii 4 to 9, 12, 20 to 24, xxxiii 13
will, -ing iii 50, 54, 66, vii 41sq., 46, viii 14, 21, 28, ix 23, x 6, 16sq., 32, xi 13, xviii, xix, xx, xxi, xxii 23, 25, 49, 51, xxiv 6, 11, 16 to 21, xxv 11sq., 14 to 17, 19, 22 to 88, xxvii 5, xxix 24, 71, xxx 20, xxxi 5, 14, xxxii 24, xxxiii 12, 15, xxxiv 10, 36, 51
Will-to-Community xxxi 13, xxxiii 8
Will-to-Live xxx 5
Will-to-Power xxx 5, 10, xxxi 2sq., 13, xxxiii 8
WITTELS xxxi 1
WOHLER xxi 16
WOODWORTH xxvii 9
words viii 20sq., xxvii 6, 10, 12, 21, xxix 56, 66 to 73, xxxiii 13, xxxiv 30sq., 34
work xxv 75, 77, 81 to 84
world xiv, xxi 12, 26, xxiv 1, 9, 13, xxv 7, 11, 21, 27, 37, 46, 51, 61, 64sq., 68sq., 77sq., 81, xxviii 9, xxix 47, xxxi 13, xxxiii 13, xxxiv 45
WRIGHT ix 18
WUNDT xxii 7, 20, xxvi 28, xxvii 1, 4, xxviii 1sq., 3, xxxiv 1, 3, 6, 9

Yes xxx 22
Yogi xxi 6

12 Pt. Bold & Roman Caps & Lower